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Springs — Vocabulary

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Spring Manufacturers Association (JSMA)/Japanese Standards Association (JSA) 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 B 0103:2012** is replaced with this Standard.

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Springs — Vocabulary

Introduction

This Japanese Industrial Standard has been prepared based on the first edition of **ISO 26909** published in 2009 without any modifications of the technical contents. However, for the terms not specified in the corresponding International Standard, the definitions thereof are added as **JIS**.

The portions given sidelines or dotted underlines are the matters not given in the corresponding International Standard. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies the terms for springs (hereafter referred to as “terms”).

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 26909 : 2009 *Springs — Vocabulary* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Classification

Terms are classified into the following seven categories, and the classification tree of terms for springs is shown in Annex A.

- a) Basis of spring
- b) Application
- c) Shape
- d) Component or part
- e) Design
- f) Manufacturing
- g) Test and inspection

3 Terms and definitions

Terms and definitions specified in this Standard are as follows.

The English equivalent and the symbol for spring are shown as reference.

NOTE 1 Those in parentheses in the term show the reading (in Japanese).

NOTE 2 Boldfaced terms in English equivalent column mean they are specified

in ISO 26909.

NOTE 3 The items whose No. is dotted underlined is the term and definition not specified in the corresponding International Standard.

a) Basics of spring

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
1000	ばね	mechanical device designed to store energy when deflected and to return the equivalent amount of energy when released	spring	
1111	圧縮ばね	spring that offers resistance to a compressive load applied axially In a narrow sense, a compression spring indicates a helical compression spring. NOTE : See JIS B 2704-1 and JIS B 2704-2.	compression spring	
1112	引張ばね (ひっぱりばね)	spring that offers resistance to an axial load tending to extend its length In a narrow sense, an extension spring indicates a helical extension spring. NOTE : See JIS B 2704-1 and JIS B 2704-3.	extension spring, <u>tension spring</u>	
1113	ねじりばね	spring that offers resistance to a torsional moment around the longitudinal axis of the spring In a narrow sense, a torsion spring indicates a helical torsion spring. NOTE : See JIS B 2709-1 and JIS B 2709-2.	torsion spring, <u>torsion</u>	
1211	線形特性ばね	spring having the spring characteristics whose deflection is linear to the load applied (see No. 5100 and No. 5111)	constant rate spring, <u>linear spring</u>	
1212	非線形特性ばね	spring having the spring characteristics whose deflection is non-linear to the load applied (see No. 5100 and No. 5112)	variable rate spring, <u>progressive rate spring,</u> <u>non-linear spring</u>	
1213	定荷重ばね (ていかじゅうばね)	spring that requires a uniformly constant load or torque to be applied regardless of the deflection	constant force spring	
1214	組合せばね	combination of multiple springs to obtain the required characteristics NOTE : Springs may be combined in a serial or parallel way. A combination spring composed of two springs is called serial double spring or parallel double spring.	combination spring	
1311	熱間成形ばね	spring formed at high temperature as called by its forming method	hot formed spring	
1312	冷間成形ばね	spring formed at ambient temperature as called by its forming method	cold formed spring	
1410	金属ばね	spring made of metallic material as called by its material	metallic spring	
1411	鋼製ばね (こうせいばね)	spring made of material of iron and steel as called by its material	steel spring	
1412	非鉄金属ばね	spring made of material of non-ferrous metal as called by its material	non-ferrous spring	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
1413	薄板ばね (うすいたばね)	spring in various shapes made of thin plate-like material as called by its material (Figure 1)	flat spring	
1414	線ばね	coil spring made of wire-like material as called by its material	wire spring	
1415	線細工ばね (せんざいくばね)	spring in various shapes made of wire-like material as called by its material (Figure 2)	formed wire spring, <u>wire forming</u>	
~~1420~~	非金属ばね	spring made of non-metallic material as called by its material	non-metallic spring	
~~1421~~	ゴムばね	spring using the elasticity of rubber as called by its material NOTE : See JIS D 0111.	rubber spring	
~~1422~~	流体ばね	spring using the elasticity of gas and/or liquid as called by its material NOTE : See JIS D 0111.	fluid spring, hydropneumatic spring	
~~1423~~	空気ばね	spring using the elasticity of air, which is a type of the fluid springs (Figure 86) NOTE : See JIS D 0111.	air spring, pneumatic spring	
~~1424~~	ガスばね	spring using the elasticity of inert gas such as argon or helium, which is a type of the fluid springs	gas spring, gas pressure spring	
~~1425~~	樹脂ばね	spring made of composite resin material as called by its material	composite spring	
~~1426~~	セラミックばね	spring made of ceramics as called by its material	ceramic spring	
~~1511~~	磁気ばね	spring using the repulsion force and attraction force by magnetism as called by its function	magnetic spring	

b) Application

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
2100	ファスナばね	spring in various shapes for fastening (see Figure 1 and Figure 3 to Figure 13)	fastener spring	
2110	止め輪 (とめわ)	circular spring for preventing axial movement by snapping into a groove formed on a shaft or in a bore (Figure 3) NOTE 1 A grip ring (see No. 2117) among snap rings is used for the grooveless shaft. NOTE 2 See JIS B 2804.	snap ring, retaining ring	
2111	サークリップ	C-shape snap ring (Figure 3)	circlip	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
2112	C 形軸用偏心止め輪	circular and annular spring for preventing axial movement of the component to be axially inserted by snapping into the grooved part of the shaft with an annular groove, which is a retaining ring of which the centre position of an inner diameter and the centre position of an outer diameter are different (Figure 3) NOTE : See JIS B 2804.	C-type retaining ring (for shaft), <u>snap ring</u>	
2113	C 形穴用偏心止め輪	circular and annular spring for preventing axial movement of the component to be inserted into the bore by snapping into the grooved part of the bore with an annular groove inside the cylindrical bore, which is a retaining ring of which the centre position of an inner diameter and the centre position of an outer diameter are different (Figure 3) NOTE : See JIS B 2804.	C-type retaining ring (for bore), <u>snap ring</u>	
2114	C 形軸用同心止め輪	circular and annular spring for preventing axial movement of the component to be axially inserted by snapping into the grooved part of the shaft with an annular groove, which is a retaining ring of which the centre position of an inner diameter and the centre position of an outer diameter are identical (Figure 3) NOTE : See JIS B 2804.	C-type retaining ring with uniform section (for shaft), <u>snap ring</u>	
2115	C 形穴用同心止め輪	circular and annular spring for preventing axial movement of the component to be inserted into the bore by snapping into the grooved part of the bore with an annular groove inside the cylindrical bore, which is a retaining ring of which the centre position of an inner diameter and the centre position of an outer diameter are identical (Figure 3) NOTE : See JIS B 2804.	C-type retaining ring with uniform section (for bore), <u>snap ring</u>	
2116	E 形止め輪	retaining ring shaped like the letter “E” for on-shaft-use (Figure 3) NOTE : See JIS B 2804.	E-type retaining ring	
2117	グリップ止め輪	retaining ring used for shafts without grooves (Figure 3) NOTE : See JIS B 2804.	grip ring	
2120	ばね座金	generic term for washers for locking screws using spring action (Figure 4 to Figure 8 and Figure 59) NOTE : See JIS B 1251.	spring washer, <u>lock washer</u>	
2121	波形ばね座金 (なみがたばね ざがね)	spring washer made by coiling wire then formed into waved shape (Figure 5) NOTE : See JIS B 1251.	waved spring washer, <u>curved spring washer</u>	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
2122	波形座金 (なみがたざがね)	spring washer made of thin ring plate on which waves are formed (Figure 6 and Figure 7)	waved washer, <u>curved washer</u>	
2123	皿ばね座金	spring washer shaped like a dish without a bottom (Figure 59) NOTE : See <u>JIS B 1251</u> .	conical spring washer	
2124	歯付き座金	spring washer made of thin ring plate with twisted teeth (Figure 8) There are internal, external, conical and internal-external combined type washers. NOTE : See <u>JIS B 1251</u> .	toothed washer, <u>toothed lock washer</u>	
2130	スプリングピン	pin made by rolling elastic plate cylindrically and used for connecting adjacent components utilizing its spring action in the radial direction when inserted into a hole (Figure 9) NOTE : See <u>JIS B 2808</u> .	spring pin, <u>roll pin</u>	
2131	溝付きスプリングピン	spring pin formed cylindrically so that both sides of the slot do not touch each other when inserted into a hole (Figure 9) There are one-sided and two-sided chamfering types. NOTE : See <u>JIS B 2808</u> .	slotted spring-type straight pin, <u>roll pin</u>	
2132	二重巻きスプリングピン	spring pin coiled one turn or more cylindrically (Figure 9) NOTE : See <u>JIS B 2808</u> .	coiled spring-type straight pin	
2140	スナップピン	pin inserted into a shaft in a radial direction for preventing relative displacement of the shaft (Figure 10)	spring cotter pin, <u>snap pin</u>	
2150	スナップリテーナ	retainer inserted into a groove on a shaft preventing relative displacement of the shaft (Figure 11)	hairpin clip, <u>snap retainer</u>	
2160	ばね板ナット (ばねいたなつと)	flat spring for fastening having insertion part and nut part to be inserted into the panel (Figure 12) NOTE : After inserting the insertion part into the panel using its spring action, the component to be retained is overlapped and fastened by the screw.	spring nut	
2161	押込みばね板ナット	flat spring for fastening having tabs at its centre for inserting a stud (Figure 13) NOTE : By the spring action and the locking action of the tabs, the studs are held, and the component to be retained and the panel are fastened and held.	push-on spring nut	
2170	ガータスプリング	coil spring of solid coiling whose ends are joined to form a ring (Figure 14)	garter spring, <u>bracelet spring</u>	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
2180	ホースクランプ	spring made by forming plate or wire into a ring and used for tightening the connection of hoses using the elasticity of the material (Figure 97)	hose clamp	
2200	懸架ばね (けんがばね)	spring which generally supports the body of automobiles, railway cars or the like	suspension spring, chassis spring	
2300	担いばね (にないばね)	leaf spring which generally supports the body of railway cars or the like (Figure 15 and Figure 16)	bearing spring, carriage spring	
2400	まくらばね	spring used between the bogie frame and the body (Figure 17 and Figure 18)	bolster spring	
2500	軸ばね	spring used between the axle box and the bogie frame to absorb the vertical shock	axle spring, bearing spring	
2600	弁ばね	coil spring used for intake and exhaust valves of internal combustion engines	valve spring	
2700	クラッチスプリング	helical torsion spring with a comparatively long solid coiling part, used for transferring torque only in the winding direction, using the winding force of the coiling part	clutch spring, <u>wrap spring</u>	
2800	スタビライザ	generic term for the springs mounted on the vehicle body for reducing its rolling when a centrifugal force is applied NOTE 1 Generally made of round bars and formed into a letter “コ”-shape, including solid type (solid stabilizer bar) and tubular type (tubular stabilizer bar) (Figure 51 and Figure 52). NOTE 2 See <u>JIS D 0111</u> .	stabilizer bar, <u>anti-roll bar,</u> <u>sway bar,</u> <u>tubular stabilizer bar</u>	
2910	シートばね	generic term for springs used in cushions on the seats, chairs, beds, etc. (Figure 39 and Figure 62) NOTE : This includes zigzag springs, helical compression springs, barrel springs, air springs, etc.	seat spring	
2920	バイアスばね	generic term for coil springs, leaf springs, etc. for generating reciprocal motions repeatedly by applying external force	bias spring	
2930	摩擦ばね	generic term for springs for generating damping using friction (Figure 43, Figure 61 and Figure 96) NOTE : There are ring springs, double coiled springs utilizing irregular cross-section, etc.	friction spring	

c) Shape

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
<u>3100</u>	板ばね (いたばね)	generic term for springs made of flat materials In a narrow sense, the leaf spring indicates a spring composed of leaves. NOTE : See JIS D 0111.	leaf spring	
3110	重ね板ばね	leaf spring composed of laminated leaves (Figure 15 to Figure 23, Figure 64, Figure 77 and Figure 78) NOTE : See JIS B 2710-1 to JIS B 2710-4 and JIS D 0111.	leaf spring, laminated spring	
<u>3111</u>	マルチリーフスプリング	leaf spring composed of laminated leaves having different lengths in incremental steps (Figure 15 to Figure 21)	multi-leaf spring	
3112	テーパリーフスプリング	leaf spring tapered for approximately its entire length except for the clamping area to other components NOTE : Also called a parabolic leaf spring because parabolic tapering is often employed in order to realize more uniform stress distribution (Figure 22 and Figure 23).	tapered leaf spring, parabolic leaf spring	
3113	J リーフスプリング	leaf spring in the shape of the letter “J” (Figure 24)	J-leaf spring	
3114	Z リーフスプリング	leaf spring in the shape of the letter “Z” (Figure 25)	Z-leaf spring	
3115	トレーリングリーフ	leaf spring used for air-suspension, connected to the chassis frame before the axle and used mainly as a linkage mechanism (Figure 26) NOTE : See JIS D 0111 for air-suspension.	trailing leaf for air suspension	
3116	プログレッシブ重ね板ばね	leaf spring composed of a main spring which always supports the load and an auxiliary spring which provides supplementary support as the load increases (Figure 21)	progressive leaf spring, progressive rate leaf spring, variable rate leaf spring	
3117	親子重ね板ばね	leaf spring composed of a main spring which always supports the load and a helper spring which provides supplementary support after the increase of load (Figure 17 and Figure 20)	two-stage progressive leaf spring	
<u>3120</u>	半だ円ばね	leaf spring shaped like a semi-ellipse (Figure 15, Figure 16, Figure 19 to Figure 23, Figure 64, Figure 77 and Figure 78)	semi-elliptic spring, half-elliptic spring	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Sym- bol for spring
~~3130~~	だ円ばね	leaf spring shaped like an ellipse (Figure 17 and Figure 18) NOTE : Combination of the two is called such as dual spring (Figure 17) and the three as triple spring (Figure 18).	full-elliptic spring	
~~3140~~	対称ばね	leaf spring the centre bolt or the centre pin of which is located at the centre of the span (Figure 15 to Figure 18, Figure 20 and Figure 64)	symmetrical leaf spring	
~~3150~~	非対称ばね	asymmetrical leaf spring the centre bolt or the centre pin of which is not located at the centre of the span (Figure 19, Figure 21 to Figure 23, Figure 77 and Figure 78)	unsymmetrical leaf spring, asymmetrical leaf spring	
~~3160~~	FRP 板ばね	leaf spring made of fibre reinforced plastics (Figure 87)	fiber reinforced plastic leaf spring	
~~3161~~	GFRP 板ばね	leaf spring made of glass fibre reinforced plastics	glass fiber reinforced plastic leaf spring	
3200	コイルばね	generic term for springs made of wire, bar or plate materials formed in coil-shape NOTE : Helical compression spring (see Figure 27, Figure 28, Figure 34 to Figure 43, Figure 84, Figure 85 and Figure 88 to Figure 93, and <u>JIS B 2704-1</u> and <u>JIS B 2704-2</u>), helical extension spring (see Figure 29 and Figure 30, and <u>JIS B 2704-1</u> and <u>JIS B 2704-3</u>), and helical torsion spring (see Figure 31 to Figure 33, and <u>JIS B 2709-1</u> and <u>JIS B 2709-2</u>), etc.	<u>coil spring</u> , <u>helical spring</u>	
3210	圧縮コイルばね	coil spring mainly subjected to the compression load (Figure 27, Figure 28, Figure 34 to Figure 43, Figure 84, Figure 85, Figure 88, Figure 89 and Figure 91 to Figure 93)	helical compression spring	
3220	引張コイルばね (ひっぱりこいるばね)	coil spring mainly subjected to the extension load (Figure 29 and Figure 30)	helical extension spring	
~~3221~~	2本線引張コイルばね	helical extension spring made of two parallel wires (Figure 30)	double wire extension spring	
3230	ねじりコイルばね	coil spring mainly subjected to the twisting moment (Figure 31 and Figure 33)	helical torsion spring	
~~3231~~	2本線ねじりコイルばね	helical extension spring made of two parallel wires (Figure 32)	double wire torsion spring	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
3232	重ね巻きねじり コイルばね	helical torsion spring in which coiling part is duplexed (Figure 33) NOTE : A spring made by turning back the end tip of helical torsion spring then winding it with the outside diameter of the first coil as the inside diameter of the second coil.	duplex torsion spring	
3240	円形コイルばね	generic term for coil springs coiled in a circular shape	circular coil spring	
3241	円筒コイルばね	cylinder-shaped coil spring (Figure 27 to Figure 36, Figure 40 to Figure 42, Figure 84, Figure 85, Figure 90 and Figure 92) NOTE : Combination of the two is called such as a double coil spring (Figure 34) and the three as a triple coil spring (Figure 35).	cylindrical coil spring, cylindrical spring, double coil spring, triple coil spring	
3242	円すいコイルばね	cone-shaped coil spring (Figure 37 and Figure 43)	conical spring	
3243	鼓形コイルばね (つづみがたこいるばね)	waisted hand drum-shaped or hourglass-shaped coil spring (Figure 38)	waisted spring	
3244	たる形コイルばね	barrel-shaped coil spring (Figure 39)	barrel spring	
3245	テーパコイルばね	coil spring made of tapered material (Figure 36)	coil spring with tapered material	
3246	たる形テーパコイルばね	barrel-shaped coil spring made of tapered material (Figure 88)	barrel tapered coil spring	
3247	片絞りコイルばね	helical compression spring that one end of cylindrical coil spring is formed into a conical shape (Figure 89)	beehive compression spring	
3248	圧縮ねじりコイルばね	coil spring which generates the compressive and torsion action (Figure 90)	compression-torsion coil spring	
3249	圧縮アークコイルばね	helical compression spring with the hyperbolic spring coil axis (Figure 91)	arc compression coil spring	
3250	不等ピッチコイルばね	helical compression spring with uneven pitches (Figure 37 and Figure 85)	variable pitch spring	
3260	異形コイルばね	generic term for the coil spring as called by its shape other than cylindrical, conical, waisted or barrel springs (Figure 93)	irregular shaped coil spring	
3261	長円コイルばね	coil spring which is wound in ellipse shape, which is one of the irregular shaped coil springs (Figure 93)	elliptical coil spring	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
3271	円形断面ばね	coil spring made of wire having a circular cross-section	circular section wire spring, ~~circular section wire coil spring~~	
3272	異形断面ばね	coil spring made of wire having a non-circular cross-section (Figure 40 and Figure 41)	non-circular wire coil spring	
3273	角ばね (かくばね)	coil spring made of wire having a rectangular or square cross-section, which is one of the non-circular wire coil springs (Figure 33 and Figure 41)	rectangular wire coil spring, ~~square cross-section wire spring~~	
3274	卵形断面ばね (たまごがただんめんばね)	coil spring made of wire having an ovate or egg-shaped cross-section, which is one of the non-circular wire coil springs (Figure 40)	egg-shaped wire coil spring, ovate wire coil spring, ~~oval wire coil spring~~	
3280	より線ばね	coil spring made of stranded wire (Figure 42)	stranded wire spring	
3290	コイルドウェーブスプリング	helical compression spring made of flat wire which is coiled in a waved manner (Figure 92)	coiled wave spring	
3300	竹の子ばね	conical spring made of material of rectangular cross-section, shaped so that its coils are capable of telescoping (Figure 43)	volute spring	
3400	渦巻ばね (うずまきばね)	spring onto itself in the form of a spiral (Figure 44 to Figure 49)	spiral spring	
3410	ぜんまい	spiral spring made of thin-plate-shape material (Figure 44 to Figure 49)	power spring	
3411	接触形ぜんまい	power spring whose materials are contacted each other (Figure 45, Figure 48 and Figure 49)	motor spring	
3412	非接触形ぜんまい	power spring whose materials are not contacted each other (Figure 44, Figure 46 and Figure 47)	non-contact-type spiral spring	
3413	ひげぜんまい	non-contact-type small and precise spiral spring, which is used especially for instruments (Figure 47)	hair spring	
3414	定荷重ぜんまい (ていかじゅうぜんまい)	power spring of solid coiling which exerts approximately constant load or torque against the change in deflection (Figure 48 and Figure 49)	constant force spiral spring	
3500	トーションバー	bar spring with given cross-section used by being twisted around the axis in the longitudinal direction (Figure 50) NOTE : <u>See JIS D 0111.</u>	torsion bar spring	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
3600	皿ばね	spring shaped like a dish without a bottom in the form of a frustum of a cone having spring action in the compression direction, which is obtained by making the disc with a hole opened in the centre conically-shaped (Figure 59 and Figure 102) NOTE : See JIS B 2706.	disc spring (Belleville), coned disc spring, Belleville spring	
~~3610~~	ダイヤフラムスプリング	disc spring which has multiple levers shaped in tongue flaps directing to the centre on its inner circumference, generating spring action when supported at the outer circumference and the bases of levers (Figure 60)	diaphragm spring	
3700	輪ばね (わばね)	spring in which ring-shaped springs are combined where the outer ring has an inner slanted friction surface and the inner ring has an outer slanted friction surface (Figure 61)	ring spring	
3810	ジグザグばね	zigzag-shaped spring (Figure 62)	zigzag spring	
3820	U字形ばね	spring in the shape of the letter “U” (Figure 63)	U-spring	
3830	金網ばね (かなあみばね)	spring made of steel mesh that steel wire, etc. of small diameter is weaved, which is compressed and formed	wire mesh spring	
~~3840~~	円弧状ばね	generic term for arc-shaped springs (U-shaped or hyperbolic) made of wire or thin plate NOTE : The term includes snap rings to prevent relative movement of the opponent component when snapped into the groove on shafts or bores (Figure 3).	hyperbolic spring	
~~3850~~	円盤ばね	doughnut-shaped spring used by supporting either of the inner rim or outer rim against the load applied to the axis line direction on the other NOTE : In a wide sense, it is the generic term for the disc-shaped spring and the Belleville spring is included (Figure 59, Figure 60 and Figure 102).	disc spring	

d) Component or part

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
4111	主ばね (しゅばね)	spring that always supports the load in a progressive leaf spring (Figure 21)	main spring	
4112	補助ばね	additional spring activated according to the increase of load in a progressive leaf spring (Figure 21)	auxiliary spring, second stage leaves	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
4113	親ばね	spring that always supports the load in a two-stage progressive leaf spring (Figure 17 and Figure 20)	main spring	
4114	子ばね	additional spring activated according to the increase of load in a two-stage progressive leaf spring (Figure 17 and Figure 20)	helper spring	
4120	ばね板 (ばねいた)	plate constituting the leaf spring	leaf, plate	
4121	親板 (おやいた)	leaf with eyes or mountings on both ends for load support (Figure 15 and Figure 64)	main leaf, top leaf	
4122	全長板 (ぜんちょうばん)	leaf having the length of the span or longer (Figure 15)	full length leaf	
4123	子板 (こいた)	leaf other than the main leaf (Figure 15)	back-up leaf	
4124	押さえばね板	leaf to protect the main leaf against the load in reverse direction (Figure 64 and Figure 65)	tension plate, auxiliary leaf, rebound leaf	
4125	長方形断面	leaf of which the cross-section is rectangular (Figure 66) NOTE : See JIS G 4801.	rectangular section	
4126	こば	generic term for the side edges of the flat steel of leaf springs (Figure 66) NOTE : The edge with the radius of about half the leaf thickness is called round edge.	round edge of flat bar	
4127	アイリーフ	leaf with an eye incorporated in the leaf spring (Figure 71)	eye leaf	
4130	ばね板端部 (ばねいたたんぶ)	end of leaf (Figure 69 and Figure 76)	leaf end	
4131	目玉 (めだま)	turned part at the leaf end (Figure 15, Figure 20 and Figure 67)	(spring) eye	
4132	二番巻 (にばんまき)	turned part at the leaf end next to the main leaf wrapping around the eye of main leaf (Figure 15 and Figure 68)	second leaf wrapper	
4133	上巻き目玉 (うえまきめだま)	eye turned upward at the main leaf end as called by type of eye of leaf spring (Figure 67)	upturned eye	
4134	下巻き目玉 (したまきめだま)	eye turned downward at the main leaf end as called by type of eye of leaf spring (Figure 67)	downturned eye	
4135	ベルリンアイ	eye aligned to the centre line of the main leaf as called by type of eye of leaf spring (Figure 67)	Berlin eye	
4136	三角開先 (さんかくかいさき)	type of shape as triangularly trimmed end of a back-up leaf (Figure 69 and Figure 76)	end trimmed with diamond point	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
4137	ミリタリラッパ	a type of second leaf wrapper of leaf spring 3/4 of which is turned (Figure 68)	military wrapper	
4141	中心穴	hole for fastening provided in the central part of each leaf of a leaf spring	centre hole	
4142	だぼ	small protruded spot of a leaf to prevent the displacement of the spring (Figure 69)	nib	
4143	だぼ穴	hole on a leaf to catch the nib (Figure 69)	slit	
4144	センタカップ	protruded area around the centre bolt hole to improve fatigue strength (Figure 70)	cup centre	
4151	センタピン	rivet to prevent the relative alignment between the band and the leaves of a leaf spring (Figure 15)	centre pin	
4152	センタボルト	fastening bolt of leaves at the centre of leaf spring (Figure 19 to Figure 21)	centre bolt	
4153	クリップ	metal component to keep the leaves of a leaf spring in position and to prevent sliding (Figure 19 to Figure 21 and Figure 73)	clip, rebound and alignment clip	
4154	クリップバンド	plate-shaped component used for a clip (Figure 73)	clip plate	
4155	クリップボルト	bolt used for a clip (Figure 20 and Figure 73)	clip bolt	
4156	クリップパイプ	tube-shaped component used for a clip (Figure 73)	clip pipe, spacer tube	
4157	ブシュ	component inserted into the eye of a leaf spring and works as a bearing (Figure 20 and Figure 74)	bush, bushing	
4158	スペーサ	plate-shaped component to secure the necessary space in a leaf spring (Figure 17 and Figure 20)	spacer	
4159	センタスペーサ	plate-like component of synthetic resin, etc. inserted between the leaves in the centre fastening part to prevent fretting corrosion (see No. 5337) (Figure 75) NOTE : See JIS B 2710-2.	centre spacer, inter-leaf liner	
4160	インタリーフ	plate of rubber, synthetic resin, etc. inserted between the leaves of a leaf spring in full length or partially (Figure 75)	inter-leaf liner, bearing liner	
4161	サイレンサ	component of rubber, synthetic resin, etc. attached to the end of the leaf spring or inserted between the coil spring and the spring seat to suppress squeak noise (No. 5326), rattle noise (No. 5325), etc. (Figure 19 and Figure 76)	silencer, tip insert, liner	
4162	マスダンパ	weight attached to the large amplitude part of a leaf spring to suppress resonance (Figure 77)	mass damper	
4163	ダイナミックダンパ	damper consisting of weight, rubber spring, etc. attached to the large amplitude part of a leaf spring to suppress resonance (Figure 78)	dynamic damper, vibration absorber	
4164	胴締め (どうじめ)	framed metal component to clamp the leaves of a leaf spring (Figure 15 and Figure 80)	band, backle	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
~~4165~~	端受け (はしうけ)	metal component to support both ends of full-elliptic spring or semi-elliptic spring for engine (Figure 18 and Figure 79)	end block	
~~4210~~	圧縮コイルばね 端部	part of coil end of a helical compression spring (Figure 81)	end of helical compression spring	
4211	オープンエンド	a type of coil end shape of helical compression spring whose end tip is not in contact with the adjacent coil in spring axis direction [Figure 81 d), e) and f)]	open end	
4212	クローズドエンド	a type of coil end shape of helical compression spring whose end tip is in contact with the adjacent coil [Figure 81 a), b) and c)]	closed end	
4213	ピッグテールエンド	a type of coil end shape of helical compression spring whose end tip is wound with reduced radius [Figure 81 h)]	pigtail end	
4214	タンジェントテールエンド	a type of coil end shape of helical compression spring whose end tip is straight and tangent to outer circumference [Figure 81 g)]	tangent-tail end	
4215	研削エンド	a type of coil end shape of helical compression spring whose end face of coil is ground [Figure 81 b) and e)]	ground end	
4216	テーパエンド	a type of coil end shape of leaf of helical compression spring or leaf spring, tapered by rolling, forging, grounding, etc. [Figure 76, and Figure 81 c) and f)]	tapered end	
4217	オープンフラットエンド	a type of coil end shape of helical compression spring which is flat whose end tip is not in contact with the adjacent coil in spring axis direction [Figure 81 i)]	open flat end	
~~4220~~	引張コイルばね 端部	winding end part of a helical extension spring (Figure 82)	end of helical extension spring	
4221	フック	hook-shaped end tip of a helical extension spring to which load is applied (Figure 29 and Figure 82)	hook, end loop	
4222	丸フック	a type of hook of helical extension spring, which is circular [Figure 82 b)]	full loop over centre	
4223	半丸フック	a type of hook of helical extension spring, which is semi-circular [Figure 82 a)]	half loop over centre	
4224	U フック	a type of hook of helical extension spring, which is U-shaped [Figure 82 f)]	long round end hook over centre	
4225	V フック	a type of hook of helical extension spring, which is V-shaped [Figure 82 g)]	V-hook over centre	
4226	角フック	a type of hook of helical extension spring, which is square [Figure 82 e)]	rectangular hook	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
4227	逆丸フック (ぎやくまるふ っく)	a type of hook of helical extension spring, which is reversed full loop over centre [Figure 82 c)]	counter-type full loop	
4228	斜め丸フック	a type of hook of helical extension spring, which is formed by raising the end coil halfway [Figure 82 j)]	inclined side hook	
4229	絞り丸フック	a type of hook of helical extension spring, which is circular hook whose end tip is formed into the cone-shaped coiling part [Figure 82 h)]	tapered end with circular hook	
4230	側面丸フック	a type of hook of helical extension spring, which is circular hook formed at the side of the coil circle [Figure 82 d)]	full loop at side	
4231	ねじ込みフック	a type of hook of helical extension spring, which is threaded hook screwed into the coiling part of end of spring [Figure 82 i)]	threaded plug to fit plain end spring	
4232	ねじ込みフック プレート	a type of threaded plug to fit plain end spring in which a plate is threaded into the coiling part of end of spring [Figure 82 i)]	hook plate with coil holes	
4233	コイルドインス クリュードプ ラグ	stud plug attached to the coned coiling part of end of spring [Figure 82 m)]	coiled-in screwed plug	
4234	二重フック	a type of full loop over centre of helical extension spring with the double-ring shaped loop at the end of spring on the central axis line of the coil turned to that direction [Figure 82 k)]	double loop	
4235	スイベルフック	a type of a hook of helical extension spring which is the free rotation hook attached to the coned end of the coiling part [Figure 82 l)]	swivel hook	
4240	ねじりコイルば ね腕部	winding end part of a helical torsion spring (Figure 83)	end of coil torsion spring	
4251	外側コイル	outer coil of a double coil spring (Figure 34)	outside spring, outer spring	
4252	内側コイル	inner coil of a double coil spring (Figure 34)	inside spring, inner spring	
4253	座	generic term for the part where the spring is seated, the opponent component, etc.	seat	
4254	研削端面	ground end surface of a helical compression spring	ground face	
4255	コイル端末	both end parts of coil spring	coil end	
4310	ぜんまい端部	inner or outer end part of power spring (Figure 45 and Figure 46)	end of power spring	
4320	ぜんまいケース	case retaining a spiral spring (Figure 94)	winding barrel	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
~~4410~~	トーションバー 端部	end section of a torsion bar spring to be fastened (Figure 50) NOTE : This end section may have larger diameter than the effective body diameter, serration or spline groove around the circle, or square or hexagonal cross-section head.	torsion bar head	
~~4420~~	止め輪の開口部	gap at end of a snap ring to allow open/close	aperture of snap ring	
~~4430~~	スタビライザ目玉部	end of stabilizer bar to be fastened to the opponent component (Figure 51)	eye of stabilizer bar	
~~4431~~	アイブシュタイプ	a type of eye of stabilizer bar of bush type (Figure 53)	eye bush type	
~~4432~~	ゴムマウントタイプ	a type of eye of stabilizer bar of the positioning rubber bush type (Figure 54)	rubber mount type	
~~4433~~	テーパアイタイプ	a type of eye of stabilizer bar of the tapered hole for tapered pore type (Figure 55)	tapered eye type	
~~4434~~	ボールジョイントタイプ	a type of eye of stabilizer bar of a ball joint type (Figure 56)	ball joint type	
~~4441~~	スタビライザリンク	link which connects the eye of stabilizer bar and the vehicle body (Figure 57)	link of stabilizer bar	
~~4442~~	横ずれ防止バンド	band or band-like structure to secure the stabilizer bar in position (Figure 58)	anti slide band	
~~4443~~	輪ばね外輪	ring integrated in a ring spring outside (Figure 61)	outer ring	
~~4444~~	輪ばね内輪	ring integrated in a ring spring inside (Figure 61)	inner ring	

e) Design

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
5100	ばね特性	relationship between the load applied to a spring and the deflection caused by the load	spring characteristics	
5111	線形特性	spring characteristics where the relationship between the load applied and the deflection is linear	linear characteristics	
5112	非線形特性	spring characteristics where the relationship between the load applied and the deflection is not linear	non-linear characteristics	
5113	交差点 (こうかいてん)	junction of the extended characteristics curves of the first stage and the second stage on the load-deflection diagram of a variable rate spring An example of variable rate spring is a two-stage pitch coil spring, progressive leaf spring, etc. (Figure 95).	inflection point	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
5114	変曲点	point where the characteristics begin to change or end to change on the load–deflection diagram of a variable rate spring (Figure 95) NOTE : In the case where the transition area of the characteristics is small enough to be ignored, the inflection point can be called the transition point.	transition point	
5115	ばね定数 (ばねじょうすう)	force or moment required to cause the unit distortion (deflection or deflection angle) in a spring NOTE : This term generally indicates the static spring rate against the static load.	spring rate, spring constant, rate of spring	R
5116	動ばね定数	spring rate against the dynamic load, indicating the spring characteristics in actual vibrating condition relating to constantly vibrating spring such as suspension spring for automobile (Figure 98) NOTE : Also called the diagonal spring constant generally up to about 15 Hz, which is equivalent to the dynamic spring constant.	dynamic spring rate	
5117	windアップ剛性	stiffness of a suspension leaf spring against the torsional moment caused by the acceleration of the vehicle body around the horizontal axis perpendicular to the moving direction	wind-up stiffness	
5118	横剛性	stiffness against the load in the perpendicular direction to the normal direction of spring load In the case of a leaf spring, this means the stiffness in the width direction of the leaf.	transverse stiffness	
5119	固有振動数	frequency of the free vibration of a vibrating system or of a single spring	natural frequency	f_c
5120	ヒステリシス	phenomenon where the load–deflection diagram has different paths depending on increase or decrease of the applied load, caused by the frictional resistance between the springs themselves or the spring and the adjacent components (Figure 98)	hysteresis	
5121	縦弾性係数	ratio of perpendicular stress to perpendicular strain within the elastic limit	modulus of direct elasticity, Young's modulus	E
5122	横弾性係数	ratio of shear stress to shear strain within the elastic limit	shear modulus, modulus of rigidity	G
5123	荷重–たわみ曲線	curve showing the relationship between the load and the deflection, indicating the spring characteristics	load-deflection diagram	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
5130	力	action exerted on or by a spring in order to reproduce or modify motion, or to maintain a system in equilibrium	force, load	F
5131	ばね荷重	load exerted on or by a spring	spring load	F
5132	指定荷重	specified spring load according to the purpose of use	specified load	F_1, F_2
5133	初荷重	load exerted on a spring when installed in a machine	initial load	
5134	最大荷重	load of maximum applied to a spring	maximum load	
~~5135~~	静的荷重	constant load with almost no time dependence	static load, dead load	
~~5136~~	動的荷重	time dependent load, such as repeatedly varying load or oscillating load	dynamic load	
5137	軸荷重	load generally applied in the direction of the coil axis line	axial load	
5138	横荷重	load on a spring applied perpendicular to the direction normally used In the case of a leaf spring, this means the load applied in the width direction of the leaf.	transverse load	
5139	横方向力	component force of the load applied to the coil spring in the perpendicular direction to the coil axis	transverse force	
5140	偏心荷重	off-centre load applied to a coil spring in the direction of the coil axis	eccentric load	
5141	ねじりモーメント	moment generated around the axis when external force is applied to a helical torsion spring or a torsion bar spring	torsional moment, torque	M
5142	セッティング荷重	load applied to a spring for presetting	presetting load	
5151	たわみ	displacement or rotation angle of a spring generated when a load or moment is applied It is the relative displacement of both ends of the spring for a helical compression spring, the change of the vertical position of the centre bolt against the line connecting both eyes for a leaf spring, the rotation angle between both ends of the spring for a torsion bar and the number of windings for a power spring.	deflection	s
5152	全たわみ	deflection of a spring from its free position to the maximum load operating position In a helical compression spring, it is the difference between the free length and the solid length.	total deflection	s_c
~~5153~~	有効たわみ	deflection based on which to determine the spring characteristics	active deflection, working deflection	
5161	取付長さ	length of a spring when mounted	set length, set height	

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
5162	セッティング長さ	length of a spring when the setting load is applied	presetting length, presetting height	
5211	最大応力	stress of maximum generated in a spring	maximum stress	
5212	最小応力	stress of minimum generated in a spring	minimum stress	
5213	平均応力	half of an algebraic sum of maximum stress and minimum stress generated in a spring under a repetitive load	mean stress	
5214	応力振幅	half of an algebraic difference of maximum and minimum stress generated in a spring under a repetitive load	stress amplitude	
5215	最小最大応力比	ratio of the minimum stress to maximum stress generated in a spring under a repetitive load	stress ratio	
5216	応力分布	acting state of stress generated in a spring or its stress distribution pattern	distribution of stresses, stress distribution	
5217	修正応力	simple torsional stress multiplied by the stress correction factor considering the direct shearing force, bending beam effect, etc., which is the stress generated on the cross-section of material for coil spring, etc.	~~corrected stress,~~ corrected torsional stress	
5218	セッティング応力	stress generated in a spring when the setting load is applied	presetting stress	
5219	ひずみ	rate of shape or volume change caused by force NOTE : There are the extension strain, compression strain and shear strain.	strain	
5220	せん断ひずみ	strain in the shearing direction indicating the distortion of an object	shear strain	
5221	せん断応力	stress leading the distortion of object in the shearing direction NOTE 1 When a load is applied to a helical compression spring, shear stress is generated on the material surface due to twisting on the material. This shear stress due to twisting is sometimes called the torsional stress. NOTE 2 It is called the modified torsional stress when a stress correction factor (see No. 5511) is taken into consideration, and unmodified torsional stress when it is not taken into consideration.	~~shear stress,~~ torsional stress	τ
5222	曲げ応力	stress in the bending direction leading the distortion of object	bending stress	σ

No.	Term (Japanese character)	Definition	Reference	
			English equivalent	Symbol for spring
5223	応力-ひずみ線図	curve showing the relationship between the nominal stress and the extension of the parallel portion of test piece in whole extension test process NOTE : See JIS G 0202.	stress-strain diagram, stress-strain curve	
5224	ばね限界値	characteristic value to predict and evaluate the long-time creeping distortion of the material of flat spring in a short time NOTE : See JIS H 3130.	spring deflection limit	
5231	破壊安全率	ratio of the load (stress) causing breakdown of spring (yield, fatigue, etc.) to the load (stress) under the normal use condition	safety factor on margin	
5232	S-N 線図 (えす-えぬせんず)	diagram drawn by taking the stress amplitude on the ordinate and the number of repetition times to the breakdown (including the number of repetition times until the test completion in case the breakdown does not occur) on the abscissa NOTE : See JIS G 0202.	S-N diagram, stress endurance diagram	
5233	時間強度線図	diagram drawn by taking the stress amplitude on the ordinate and the mean stress on the abscissa to indicate the life (number of repetition times to the failure) under arbitrary repetition condition	fatigue strength diagram	
5234	疲労強度	maximum stress level at which a spring withstands an unlimited number of repetitive stress cycles	fatigue strength	
5235	疲労限度線図	diagram which shows the way the fatigue limit varies depending on the combination of the stress amplitude and mean stress NOTE 1 There are fatigue limit diagrams presented by Goodman (Figure 101), Hey and Smith. NOTE 2 See JIS B 2704-1 and JIS B 2709-1.	fatigue limit diagram	
5311	座屈	phenomenon in which the axis of a coil suddenly bends in a waved or spiral-shape when the compressive load or the torsional moment applied to the coil spring exceeds the limit (Figure 100) NOTE : The buckling load varies significantly depending on the binding condition of the seat, the slenderness ratio of the coil spring, etc.	buckling	