KES

Weld Bolt

KES E-A028

Contents

KIA MOTORS

1. Scope of Application

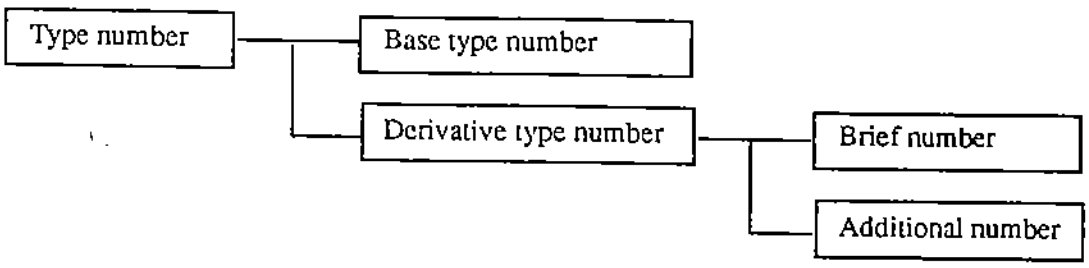
This standard specifies the weld bolt for automobiles (hereinafter referred to as the "bolt"). This bolt shall be used when its head on the side of bearing surface is projection-welded. If its head is welded on the side of top face, this bolt shall not be used.

2. Purpose

This standard aims at giving commonness to part of the bolt and at securing the proper quality.

3. Type Number

3.1 Structure of type number: The structure of the type number of the bolt shall conform to the following.



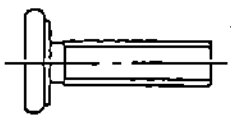
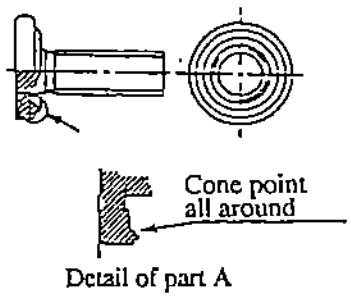
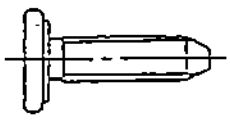
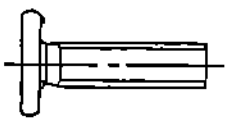
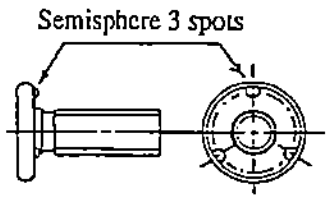
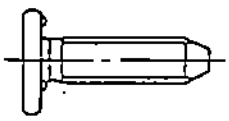
3.2 Base type number: The base type number shall be as Table 1 according to the shape.

3.3 Derivative type number: The derivative type number consists of the brief number and the additional number. Its structure shall conform to KES A-A006 (Refer to 10. Structure of Part Number).

3.3.1 Brief number: The brief number is the number made by shortening the base type number to three digits. The combination of the brief number and the base type number is shown in Table 1.

3.3.2 Additional number: The additional number shall be used when other surface treatment than the basic surface treatment is required, and its structure shall conform to KES A-A006.

Table 1 Type of bolts

Type		Base Type Number (Brief Number)	Shape			Place to be Used
			End point		Welding projection	
Type 1	A-type	99790 (9H0)	Unpointed end			Place in which seal-ability is required. (Welded all around)
	B-type	99790 XXXX 9 (9H0)	Half cone point			
Type 2	A-type	99791 (9H1)	Unpointed end			Place in which seal-ability is not required. (Welded at 3 spots)
	B-type	99791 XXXX 9 (9H1)	Half cone point			

Remarks 1. As the A-type bolt has the lowest price in the same kind, it shall be used preferably.

2. If half cone point bolt of B-type is indicated for improvement of operatablility, affix 9 to the final tenth figure of the part number.
Therefore, the chromate finishing of black (B), gloss (E) and green (G) shall not be applied to the half cone point bolt though the color chromate of zinc plating can be applied to it.

4. Mechanical Properties and Test Method

Mechanical properties of the bolt shall conform to Table 2.

Table 2

Test item \ Strength division					4.8	6.8 $l \leq 50$	6.7 $l > 50$	Test Method
Nominal diameter d (mm)					4,5	6,8,10		
Tensile strength *	Product	Wedge tensile strength	kgf/mm² {N/mm²}	Minimum	40 {392}	60 {588}		KES C-C 001
		Smooth tensile strength		Maximum	55 {539}	80 {785}		
Yield point (Proof stress)			kgf/mm² {N/mm²}	Minimum	32 {314}	48 {471}	42 {412}	
Proof load stress			kgf/mm² {N/mm²}	—	29.1 {285.4}	43.7 {428}	38.2 {412}	
Hardness	Brinell hardness		HB	Minimum	116	170		
				Maximum	229	245		
	Rockwell hardness		HRB	Minimum	62	88		
				Maximum	88	102		
Elongation after break			%	Minimum	14	16		

* Tensile strength shall be evaluated by wedge tensile strength.
Even if the bolt is broken, as shown in the example A of Fig. 1, the bolt is successful when the bolt satisfies the standard after the smooth tensile strength test. A bolt which is broken as shown in the example B of Fig. 1 when the test of wedge tensile strength was carried out shall be disqualified.

Fig. 1 Shape of Break

5. Shapes and Dimensions

Shapes and dimensions of the bolts shall conform to the Appendix Tables 1 and 2.

6. Thread

The thread of bolts shall conform to Table 3.

Table 3 Thread

Type of Threads	Accuracy
Metric coarse screw threads in *1 KS B 0201	Limits of sizes and tolerances of 6 g in *2 KS B 0211
Metric fine screw threads in *3 KS B 0204	Limits of sizes and tolerances of 6 g in *4 KS B 0214

*1 JIS B 0205 *2 JIS B 0209 *3 JIS B 0207 *4 JIS B 0211

7. External Appearance

The external appearance of the bolts shall have no defects such as burrs, roughness, rust and the like harmful for use.

8. Materials

Materials of the bolts shall conform to Table 4.

Table 4 Materials

Strength division	Material	
	Symbol	Pertinent standard
4.8	SWRM 6, 8, 10, 12	JIS G 3505
	S10C - S15C	*1 KS D 3752
6.8	S25C	*1 KS D 3752
	TS25C-6B-C	KES B-B017
6.7	SWCH25K	*2 KS D 3697

*1 JIS G 4051 *2 JIS G 3539

9. Inspection

Carry out the inspections of the bolts on items 3 to 7 abovementioned. The results shall conform to every standard.

10. Structure of Part Number

Example 1: Weld bolt type 1 unpointed end Nominal diameter 6 mm Length 16 mm

99790 06 16

Example 2: Weld bolt Type 2 Nominal diameter 8 mm Length 20 mm Half cone point

99791 08 20 9

Example 3: Derivative finishing (Change to MFZnT1 -C)

9H0 90 0816

- 0816 — Size number (No change)
- 90 — Additional number (MFZnT1)
- 9H0 — Brief number (Corresponding to the base type number 99790)

11. Alteration of Specification

The bolt specifications may be altered only after the revision of this standard.
This standard is revised following the specified proceedings and in accordance with the KMS Proposal System.

12. Part Name

Part name of the bolt shall be the weld bolt (BOLT-WELD).

13. Report of Effective Date

No items to be reported.

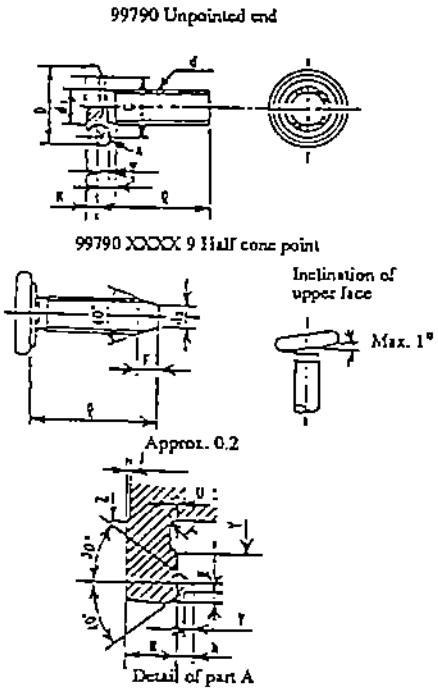
14. Quoted Standard

Refer to the latest editions

JIS B 0101	(Glossary of Terms Relating to Fasteners)
JIS B 0205	(Metric Coarse Screw Threads)
JIS B 0207	(Metric Fine Screw Threads)
JIS B 0209	(Limits of Size and Tolerances for Metric Coarse Screw Threads)
JIS B 0211	(Limits of Sizes and Tolerances for Metric Fine Screw Threads)
JIS B 1021	(Tolerance System for Threaded Fasteners)
JIS B 1071	(Method of Verification for Size and Geometry of Threaded Fasteners)
JIS G 3505	(Low Carbon Steel Wire Rods)
JIS G 3539	(Carbon Steel Wires for Cold Heading and Cold Forging)
JIS G 4051	(Carbon Steels for Machine Structural Use)
JIS Z 2243	(Method of Brinell Hardness Test)
JIS Z 2245	(Method of Rockwell and Rockwell Superficial Hardness Test)
KES C-C001	(Mechanical Properties for Bolts and Screws)
KES B-B017	(Steels for Cold Forging (Coil Material))

Appendix Table 1 Shape and Dimensions of 99790, 99790 XXXX 9 (Half Cone Point)
(9H0) (9H0)

Unit: mm



Nominal diameter No.		06	08
Nominal diameter d		6	8
Screw pitch p		1	1.25
d1	Basic dimension	6	8
	Tolerance	0 -0.1	+0.1 -0.15
D	Basic dimension	14	18
	Tolerance	±1	±1
H	Basic dimension	2.5	3.5
	Tolerance	±0.2	±0.2
h	Basic dimension	0.8	0.8
	Tolerance	±0.1	±0.15
G	Basic dimension	12	14.5
	Tolerance	±0.4	±0.4
m (min.)		1.2	1.5
r	Min.	0.3	0.5
	Max.	0.5	0.7
d2		3.8	5
F	Min.	1.2	2
	Max.	2.5	3.2
U		0.4	0.6
V	Basic dimension	0.5	0.5
	Tolerance	±0.1	±0.15
W		0.2-0.4	0.15-0.45
Y		Ø9	Ø12
Z		Ø6 Max	ø8 Max.

Length number	l		Un-pointed end	Half cone end	Un-pointed end	Half cone end
08	8	±0.5				
10	10			5.0		
12	12		5.5	5.4		
16	16		6.2	6.0		
20	20			6.7		12.9
25	25			7.6		14.3
30	30			8.5		
35	35			9.3	17.5	
40	40			10.2		
Over 40	50≥		At intervals of 5 (For special use)			
	50<	±0.7				

Remarks 1. The length of incompleted thread (X) including underhead shank shall be approximately three ridges.

2. The hole diameter of the bolt shall conform to the following table.

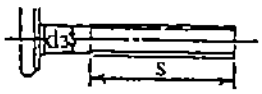
Unit: mm

Nominal Dimeter d		6	8
Hole diameter	Basic dimension	6.2	8.2
	Tolerance	+0.2 0	+0.2 0

3. As a rule, the bolt shall be a full threaded one. But in case the bolt has longer threads, the shape as shown in the following figure may be made by keeping the effective thread length (S).

Unit: mm

Nominal Dimeter d		6	8
S	Basic dimension	30	3.5
	Tolerance	+3 0	+3 0

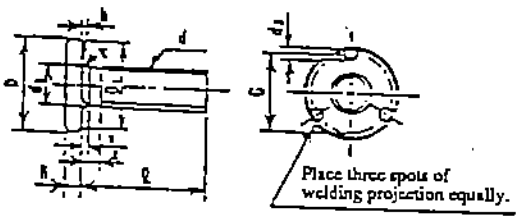


d_3 : Diameter before thread rolling

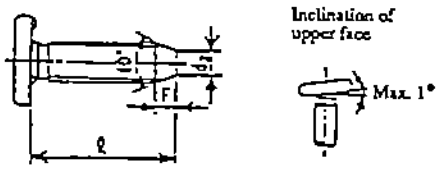
4. As the bolts of which the length is indicated by figures(mass g) in columns of length had been used when the standard was revised, these shall be used preferably. If a new bolt is established, inform the Development Standardization Group.

Appendix Table 2 Shape and Dimension of 99791, 99791 XXXX 9 (Half Cone Point)
(9H1) (9H1)

99791 Unpointed end



99791 XXXX 9 Half cone point



Remarks 1. Variation of height (H + h) including welded spots per bolt shall be within 0.15 mm.

2. The dimension of D1 shall be the shape and dimension when the welding projection at three spots can be formed completely.

3. The length of incompleted thread (X) including underhead shank shall be approximately three ridges.

4. If zinc plating colored chromate (MFZnT1-C) is to be indicated, affix "A" to the tenth figure of the part number. Provided that "A" is indicated, attention shall be paid to conditions of welding and management.

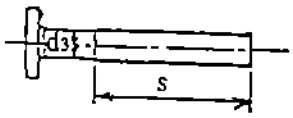
5. As a rule, the bolt shall be a full threaded one. But when the bolt has longer threads, the shape as shown in the following figure may be made by keeping the effective thread length (S).

Unit: mm

Nominal diameter number				04	05	06	08	10
Nominal diameter d				4	5	6	8	10
Screw pitch p				0.7	0.8	1	1.25	1.25
d1	Basic dimension			4	5	6	8	10
	Tolerance			0 -0.1			0 -0.15	
D	Basic dimension			10	12	14	18	22
	Tolerance			+1 0				
H	Basic dimension			1.3	1.8	2.5	3.5	4.5
	Tolerance			±0.2				
h	Basic dimension			0.7		0.8		1
	Tolerance			± 0.1				
d2	Basic dimension			1.5	2	2.5	3	4
	Tolerance			±0.25				
G Max.				8.5	10	11.5	15	18
m	Min.			1.1		1.2		
	Max.			1.4		1.5		
r	Min.			0.2		0.3	0.5	
	Max.			0.4		0.5	0.7	0.8
d2				—	3	3.8	5	6.5
F	Min.			—	1.2		2	2.5
	Max.			—	2.5		3.2	4
Length No		l						
99791 Unpointed end	08	8	± 0.5	1.6				
	10	10		1.8	3.1	4.9		
	12	12		1.9	3.3	5.2	11.0	
	16	16		2.2	3.8	6.0	12.1	
	20	20			4.3	6.6	13.5	
	25	25			4.9	7.4	15.1	
	30	30				8.3	16.4	
	35	35				9.2	18.1	
	40	40			6.7		20.2	
	Over 40	50≥		At intervals of 5				
		50<	±0.7	(For special use)				
Length No.		l						
99791 XXXX 9 Half cone point	12	12	±0.5		3.3	5.2		
	16	16			3.8	6.0	12.1	
	20	20				6.6	13.3	
	25	25				7.4	14.9	
	30	30				8.3	16.4	
	35	35					17.9	
	40	40					19.7	
	Over 40	50≥		At intervals of 5				
		50<	±0.7	(For special use)				

Unit: mm

Nominal Diameter d		4	5	6	8	10
S	Basic dimension	30			35	40
	Tolerance	+3 0				



d3 : Diameter before thread rolling

6. The hole diameter of the bolt shall conform to the following table.

Unit: mm

Nominal Diameter	4	5	6	8	10
Basic dimension	4.2	5.2	6.2	8.2	10.2
Tolerance	+0.2 0				

7. As the bolts of which the length is indicated by figures (mass g) in columns of length had been used when the standard was revised, these shall be used preferably. If a new bolt is established, inform the Development Standardization Group.