INTERPLANT STANDARD - STEEL INDUSTRY		
IPSS	**SPECIFICATION FOR BULL DOG GRIPS (*first revision*)** Based on IS 2361:1994	**IPSS:1-07-031-03** Formerly: IPSS:1-07-031-87

0. FOREWORD

0.1 This Inter Plant standard has been prepared by the Standards committee on Portable Maintenance Equipment, IPSS 1:7, with the active participation of the representatives of all the steel plants and established manufacturers of bull dog grips and was adopted in September 2003.

0.2 Inter Plant Standardization for steel industry primarily aims at achieving rationalisation and unification of parts and sub-assemblies used in steel plant equipment and accessories, and provides guidance in indenting stores for existing equipment (or while placing orders for additional requirements) by individual steel plants. For exercising effective control on the inventories, it is advisable to select a fewer number of sizes (or types) of products mentioned in this document, in the form of Company Standard of individual steel plants; it is not desirable to make deviation in technical requirements.

0.3 This IPSS Standard was first published in year 1987. During the usage of this standard, it was felt that certain changes were necessary to increase the effectiveness of this standard. These changes have been incorporated in this revision which are based on practical experience of the plants.

1. SCOPE

1.1 This standard covers the requirements regarding the material and dimensions for bulldog grips for wire ropes of nominal sizes from 6 mm to 52 mm.

NOTE 1: Bull dog grips are used as simple and effective mechanical means of securing the end of a steel wire rope as an alternative to

splicing/socketing in the absence of skilled labour or facilities necessary for such work. They are also useful for securing the ends of temporary ropes and ropes which may need adjustments of length.

NOTE 2: Bull dog grips is neither intended for mine hoisting ropes nor for the permanent attachment of crane ropes in rope transmission.

NOTE 3: This standard is based on IS 2361:1994 `Specification for bull dog grips (second revision)'.

2. MATERIAL AND CONSTRUCTIONAL FEATURES

2.1 All bolts shall conform to 015 M 75 of IS:1570 (Parts 1 to 7):1996 "schedule for wrought steel for general engineering purposes" and shall have in the normalized condition a minimum tensile strength of 420 N/mm^2 and a maximum tensile strength of 500 N/mm^2.

2.1.1 The nuts shall be of hexagonal type complying with the requirements of IS 1363(Parts 1 to 3):1992.

2.2 Bridges – The bridges shall be of steel castings or steel drop forgings. Steel casting shall comply with Grade 23-45 of IS 1030:1998 `Specification for steel castings for general engineering purposes (fifth revision)'. Steel drop forgings shall comply with the requirements of class 1 of IS 2004:1991 `Specification for carbon steel forgings for general engineering purposes (third revision)'.

2.2.1 The channel holding the rope shall be smooth in the direction of the rope axis. All fine or flashes produced during manufacturing shall be dressed to a level surface. The bolt holes in the bridges may be drilled or cored and shall be free fit to the parallel positions of the U-bolts. If drop forged, the bridges shall be normalised at the temperatures between 880 to 910°C followed by withdrawal from the furnace and cooling in still air. It shall be possible for the bridges to move as close as possible to the U-portion of the bolt as 1.5 times the nominal

diameter of the ropes to be gripped. The bridges shall be suitably scored to suit a round strand rope of right hand lay having six strands.

2.3 Screw Threads – Screw threads for U-bolts and nuts (after galvanising when specified) shall conform to the medium class of IS 4218(Parts 1 to 6) `ISO metric screw threads'. The threads shall be oiled with non-drying lubricating oil.

2.4 Galvanising – The grip shall be galvanised by the hot – dip process as per IS 2629:1985 `Recommended practice for the hot dip galvanising of iron and steel (first revision)'. Zinc conforming to at least Zn 98 of IS 209:1992 `Specification for zinc (fourth revision)' of composition as given below shall be used for the purpose of galvanising :

	% (Max.)
Zinc	98
Lead	1.6
Cadmium	0.5
Iron	0.05
Total impurities	2.0

3. DESIGNATION

3.1 A bull dog grip which is forged (F), galvanised (G) by the hot dip process and suitable for wire rope of 12 mm diameter shall be designated as follow :

Bull dog grip FG 12– IPSS:1-07-031-03

4. DIMENSIONS

4.1 The dimensions of the bull dog grips shall be as given in Table-1.

TABLE-1

DIMENSIONS OF THE BULL DOG GRIPS

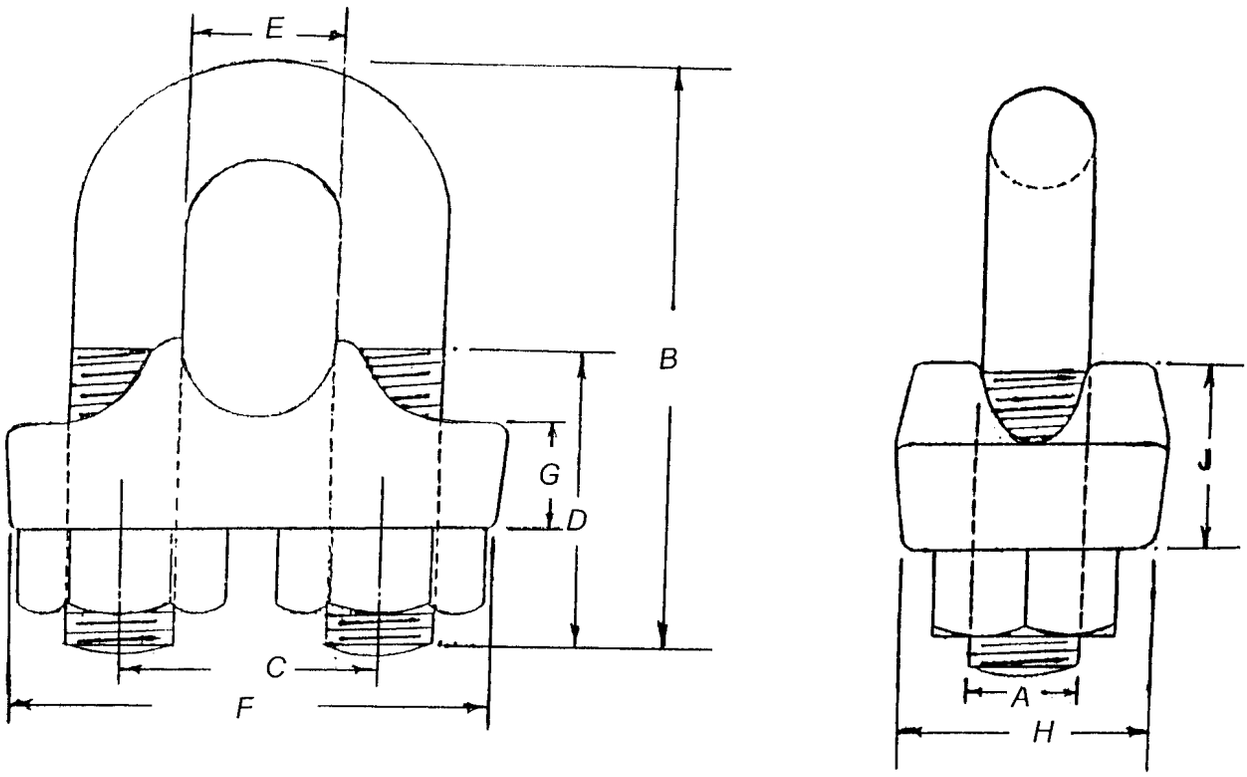

FIG. 1 Bull Dog Grip

Nominal size (dia of rope) d	A	B (3A+2d)	C (E+A)	D (2A+0.6d)	E	F (C+2A)	G (A)	H (2.3A)	J (1.8A)
6	M6	30	13	16	7	25	6	14	11
8	M8	40	17	21	9	33	8	18	14
10	M10	50	21	26	11	41	10	23	8
12	M12	60	25	31	13	49	12	28	1
14	M14	70	30	36	16	58	14	32	22
16	M14	74	32	38	18	60	14	32	25
20	M16	86	37	43	21	69	16	37	25
22	M18	98	43	49	25	79	18	41	29
24	M20	108	47	55	27	87	20	46	32
26	M20	112	49	56	29	89	20	46	36
28	M20	118	51	57	31	91	20	46	36
32	M22	130	57	63	35	101	22	51	40
36	M24	144	63	70	39	111	24	55	43
38	M24	148	65	71	41	113	24	55	43
41	M27	163	72	79	45	126	27	62	49
44	M27	169	75	80	48	129	27	62	49
48	M30	186	80	88	50	135	30	69	54
52	M30	194	86	91	56	146	30	69	54

NOTE: For wire rope of intermediate sizes, the next larger size of bull dog grip shall be used.

5. METHOD OF PROPER APPLICATION

5.1 The bull dog grips shall be fitted to wire ropes as shown in figure 2 and not as shown in figure 3. The bridge of the bull dog grip shall invariably be fitted on the working part of the rope, and for the U bolt on the rope tail or dead end of the rope. Bull dog grips shall not alternate in position on the rope.

5.2 It is recommended that the following minimum number of bull dog grips be fitted at each connection :

Nominal diameter of wire ropes in mm	Minimum number of bull dog
Upto and including 20	3
Over 20, upto and including 32	4
Over 32, upto and including 38	5
Over 38, upto and including 44	6
Over 44	7

5.3 The bull dog grips shall be spaced at a distance of approximately six times the rope diameter.

5.4 The efficiency of the wire rope termination made with bull dog grips shall depend entirely upon their current placement on the ropes, and the care and skill in the fitting and screwing up of the grips.

If properly made with the number of grips and spacing as recommended, and all the grips placed with their bridges on the long part of the rope, and the U-bolts bearing on the short or tail end of the rope, such a terminal would be expected to hold 85% to 90% of the ropes actual breaking strength. With the bull dog grips placed the wrong way round, the efficiency would be of the order of 75% or less.

5.5 The terminal made with the bull dog grips shall always be inspected after one or two loadings and in most cases it will be found that the nuts require further adjustment.

With improperly tightened nuts, or with fewer bull dog grips than the number recommended, the ropes end may draw through the grips at a very early stage in the loading.

5.6 The bull dog grip furthest from the eye or thimble shall not be very severely screwed up, for that is the vulnerable section in this form of assembly. Serving each rope at this position, so that this grip seats on serving, will help to increase the efficiency of the connection, as will a wrapping of convas or the like.

6. INFORMATION TO BE SUPPLIED WITH AN ENQUIRY OR ORDER

a) The dia of rope for which bull dog grips are required.
b) The quantity.
c) Hot dip galvanising is required.
d) IPSS Number.

7. TEST FOR GALVANISING

7.1 When specified by the purchaser, samples of bull dog grips shall be tested in accordance with IS 2633:1986 `Methods of testing uniformity of coating on zinc coated articles (second revision)'.

7.1.1 The purchaser shall state clearly at the time of enquiry and order whether he requires the zinc coating to be tested, the number of samples he requires to be tested and the number of dips the samples has to be subjected to.

NOTE: It is recommended that one sample per consignment of each size of bull dog grip shall be subjected to this test.

8. INSPECTION

8.1 The representative of the purchaser shall have free access to the works of the manufacturer at all reasonable times; he shall be at liberty to inspect the manufacture of the bull dog grips at any stage.

8.2 When so specified in the enquiry and order, the manufacturer shall afford proof to the purchaser that the material used is the manufacture of bull dog grips supplied complies with the requirements of clause 2.

9. WORKMANSHIP

9.1 The bull dog grips shall be free from roughness or sharp edges liable to cause injury to the wire ropes.

10. MARKING

10.1 The following information shall be marked on the bull dog grip :

a) Name of the manufacture or his Trade Mark
b) Serial or batch number, and
c) Designation of this standard.

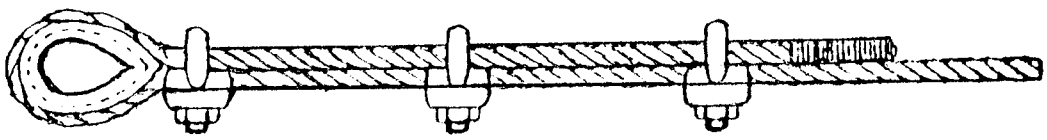

FIG. 2 RIGHT WAY OF APPLYING BULL DOG GRIPS

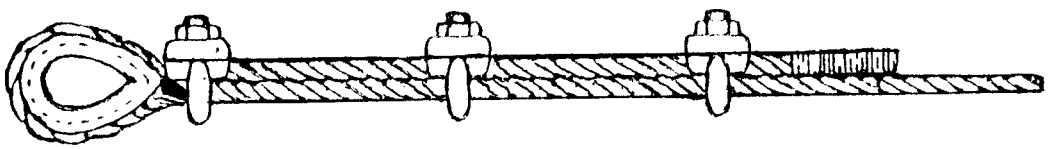

FIG. 3 WRONG WAY OF APPLYING BULL DOG GRIPS