Inspection Procedure of Eyebolts

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1. YOUR SAFETY IS FIRST:

Your safety wear is mandatory at job sites including in general: suit, shoes, helmet, gloves, ear plugs, glasses, and mask.

2. SCOPE:

This procedure covers the inspection and testing of eyebolts.

3. PRODUCT/ MANUFACTURE STANDARDS:

AS 2317-1998	Collared eyebolts
B18.15 - 2015	Forged Eyebolts
B30.20 - 2018	Below-the-Hook Lifting Devices
BS EN ISO 3266:2010+A1:2015	Forged steel eyebolts grade 4 for general lifting purposes
ISO 3266:2010	Forged steel eyebolts grade 4 for general lifting purposes

4. EYEBOLTS – DEFINITION AND TYPES:

An eyebolt is a bolt with a loop at one end. They are used to firmly attach a securing eye to a structure, so that ropes or cables may then be tied to it.
Eyebolts types are: collar eyebolt, dynamo eyebolt, eyebolt with link

The following figure shows a collar eyebolt with related specifications.

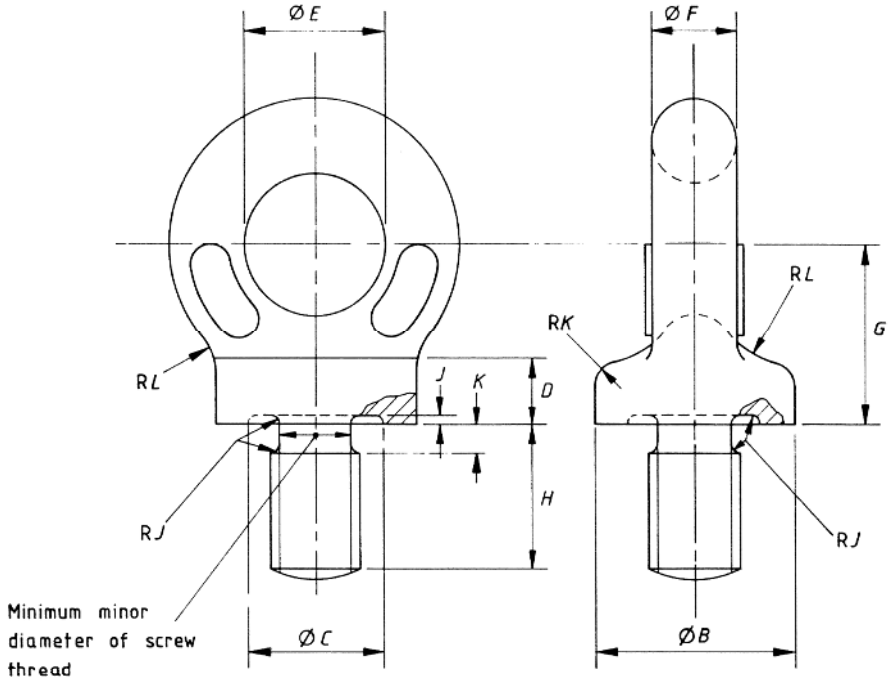

Figure 1. Collar eyebolt

Table 1. Collar eyebolt (see figure 1)

Safe working load (axial)	Metric thread dia.	*B* = 1.5*E*	*C* = *E*	*D* = 0.5*E*	*E**	*F* = 0.6*E*	*G* = 1.33*E*	*H* = 1.17*E*	*J*	*K* = 0.17*E*	*L* = 0.6*E*
tonnes	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
0.4	12	22	15	7	15	9	20	18	1	3	9
0.8	16	29	20	10	20	12	26	23	1	3	12
1.6	20	40	27	14	27	16	36	32	1	5	16
2.5	24	52	35	17	35	21	46	40	2	6	21
4.0	30	65	44	22	44	26	58	51	2	7	26
6.3	36	81	54	27	54	32	72	63	3	9	32
8.0	42	90	60	30	60	36	80	70	3	10	36
10.0	48	101	68	34	68	40	90	79	3	11	40
12.5	52	115	76	38	76	46	102	89	3	13	46
16.0	56	128	86	43	86	51	114	100	4	14	51
20.0	64	144	96	48	96	58	128	112	4	16	58
25.0	72	162	108	54	108	65	144	126	4	18	65

*$E \simeq 21.6\sqrt{\text{SWL}}$

NOTE. Dimension *K* is to be regarded as a minimum and may be increased to 2.5 times the thread pitch in order to facilitate die head screwing.

The following figure shows an eyebolt with link with related specifications.

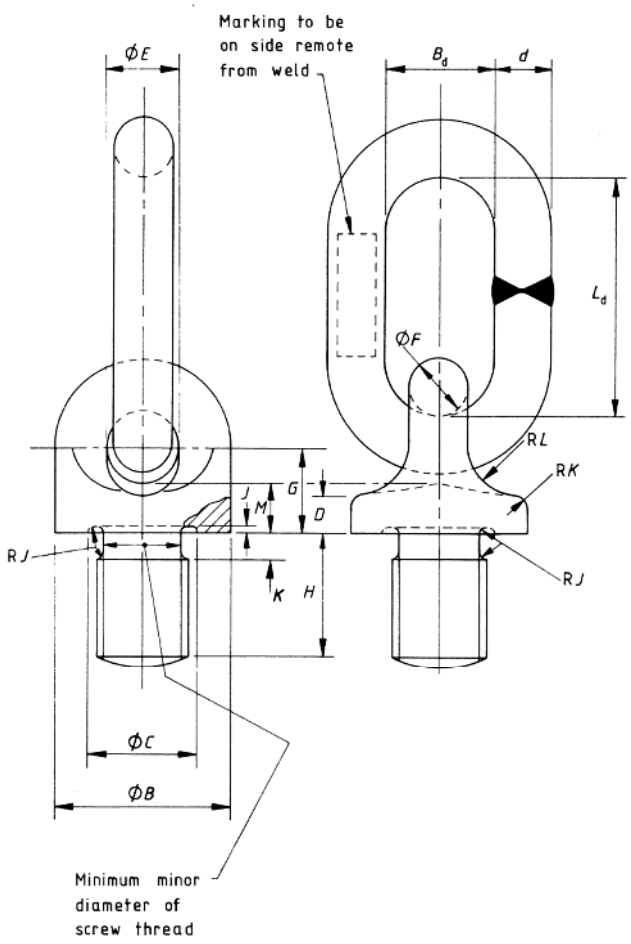

Figure 2. Eyebolt with link

Table 2. Eyebolt with link (see figure 2)

Safe working load (axial)	Metric thread dia.	B = 2.6E	C = 1.6E	D = 0.6E	E*	F = 0.8E	G = 1.3E	H = 1.8E	J	K = 0.25E	L =0.9E	M = 0.8E	Link		
													d = 0.84E	B_d = 1.6E	L_d = 3.5E
tonnes	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.0	20	39	24	9	15	12	20	27	1	4	14	12	13	24	53
1.6	24	47	29	11	18	14	23	32	1	5	16	14	15	29	63
2.5	30	60	37	14	23	18	30	41	2	6	21	18	19	37	80
4.0	36	75	46	17	29	23	38	52	2	7	26	23	24	46	102
6.3	48	94	58	22	36	29	47	65	3	9	32	29	30	58	126

*$E \simeq 14.5\sqrt{SWL}$

NOTE. Dimension *K* is to be regarded as a minimum and may be increased to 2.5 times the thread pitch in order to facilitate die head screwing.

The following figure shows a dynamo eyebolt with related specifications.

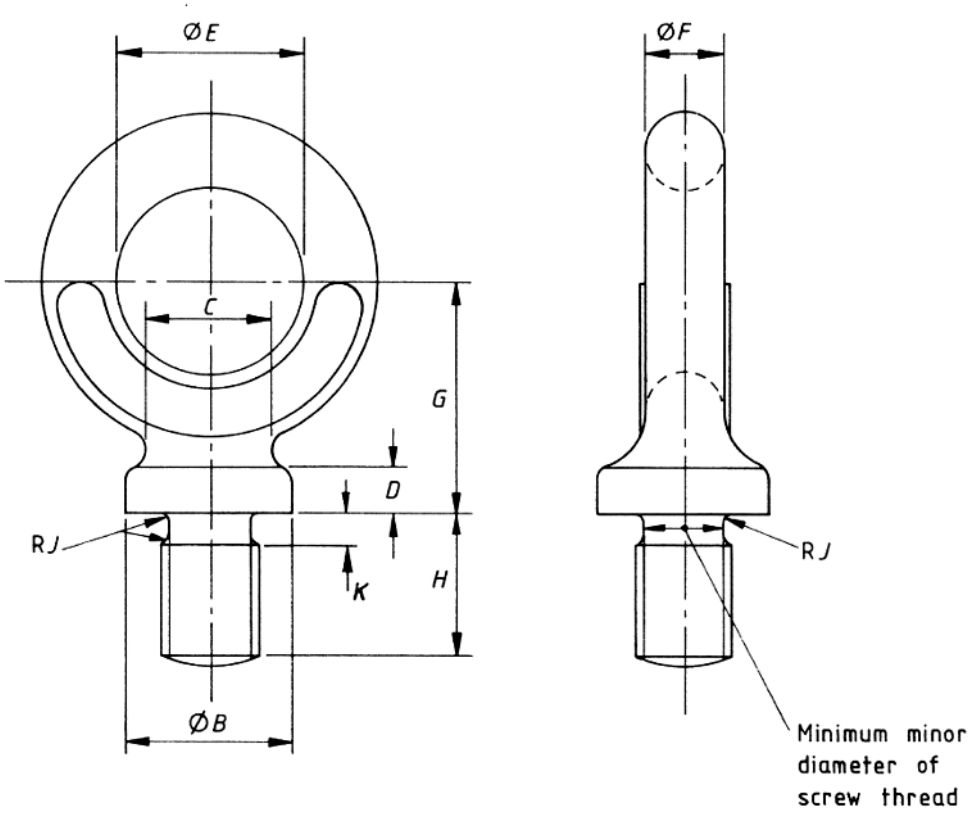

Figure 3. Dynamo eyebolt

Table 3. Dynamo eyebolt (see figure 3)

Safe working load (axial)	Metric thread dia.	*B* = 0.8*E*	*C* = 0.64*E*	*D* = 0.23*E*	*E**	*F* = 0.38*E*	*G* = 1.2*E*	*H* = 0.8*E*	*J*	*K* = 0.11*E*
tonnes	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
0.32	12	17	14	5	22	9	27	18	1	3
0.63	16	23	18	6	29	11	34	23	1	3
1.25	20	32	25	9	40	15	47	32	1	5
2.0	24	40	32	12	51	19	60	40	2	6
3.2	30	51	41	14	64	24	76	51	2	7
5.0	36	63	50	18	79	30	95	63	3	9
6.3	42	70	56	20	88	33	105	70	3	10
8.0	48	79	63	22	99	37	118	79	3	11
10.0	52	89	71	26	112	42	134	89	3	13

*$E \simeq 35.6\sqrt{\text{SWL}}$

NOTE. Dimension *K* is to be regarded as a minimum and may be increased to 2.5 times the thread pitch in order to facilitate die head screwing.

IM RTANT. Dynamo eyebolts are to be used only for axial lift. If fitted in pairs or in groups a spreader beam sh ıe should always be used.

5. INSPECTION INTERVALS:

Eyebolts fall under the heading of '*lifting accessories*', and should be examined by a competent person at periods not exceeding six months.

6. THOROUGH EXAMINATION:

Eyebolts shall be inspected for:

- Marking (as per 8. MARKING): marking shall be clear and legible.
- Threads shall be free of wear, corrosion, and any sign of damage
- No debris in the thread or underside of the collar shall be present
- There shall be no distortion of the eyebolt: no bent shank, deformed eye, or reduced diameter at the undercut are allowed
- There shall be no damage of the eyebolt: no nicks, cracks, gouges, or corrosion are allowed.
- Links shall be checked: Links distortion, or wear (max permissible wear 8% of original diameter).

If any faults are found at the time of examination, which would Affect the safe use, then it must be withdrawn from service and details recorded on the inspection report

7. PROOF LOAD TEST:

Proof load test is conducted by manufacturer after manufacture and subsequent heat treatment, the manufacturer shall provide a valid certificate of proof load applied, in case of repair or need for proof load test, the eyebolt shall be subjected to an axial proof load equal to at least 2 × or WLL of the eyebolt, the eyebolt shall withstand this load with no visible permanent deformation.
After removal of proof load, the eyebolt shall be thoroughly examined, the eyebolt is considered accepted if there are no signs of visible defects.

8. MARKING:

Each eyebolt shall be legibly marked in a manner that does not impair its mechanical strength.
The following information should be legibly and permanently marked on the eyebolt:

- Quality Marking symbol 'M' enclosed in a circle.
- To avoid confusion, this should be kept remote from any thread identification.
- WLL.
- Distinguishing Mark.

New eyebolts will usually be marked with a batch number by the manufacturer. Whilst this gives the manufacturer traceability to production, heat treatment and test records, it is of little use to the user or tester and examiner. Steps must therefore be taken to ensure this number is made unique:

- Thread Identification.
- M denotes ISO metric threads, coarse series. The identification should also include the thread diameter (e.g. M20).
- BSW denotes BS Whitworth threads. The identification should also include the thread diameter (e.g. ½ BSW).

- UNC denotes unified coarse threads. The identification should also include the thread diameter (e.g. ¾ UNC).

If the item is not already marked, it shall be clearly stamped or marked with an identification number and if the test is satisfactory, the WLL and date of the test.

9. REPORTING AND CERTIFICATION:

A certificate of test and thorough examination will be issued upon the satisfactory completion of the examination, i.e. the lifting equipment is safe to operate

A defect report will be issued if the lifting equipment fails to meet the requirements.

10. Inspector Competency and Qualification:

Inspector shall have minimum qualification of LEEA Foundation – LEEA Lifting Equipment General