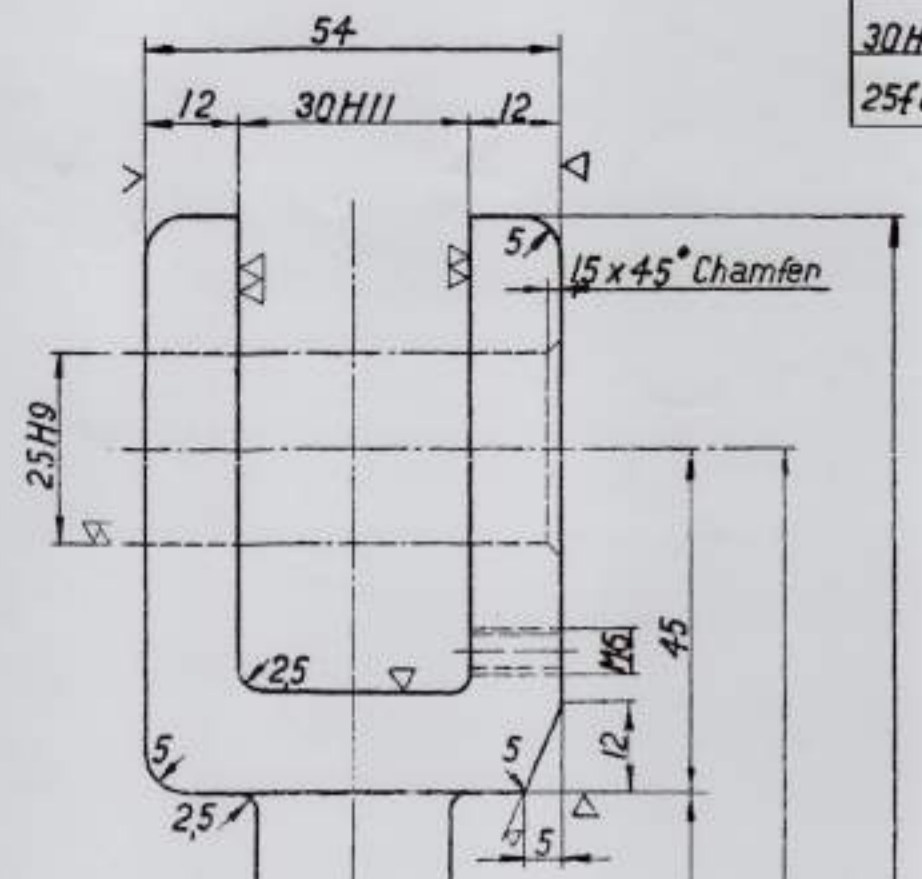
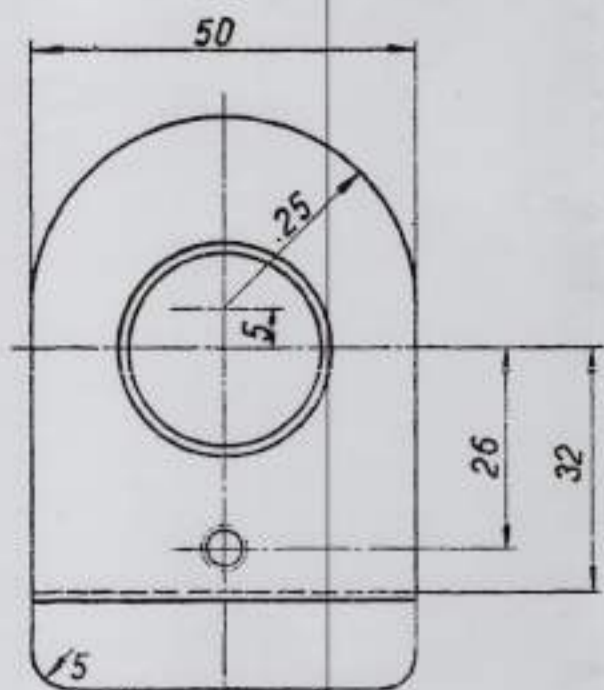




FOR EXPLANATION OF DIMENSIONING ETC. SEE CIARM NOTE SHT No. 1  
 FIRST ANGLE PROJECTION. DIMENSIONS ARE IN mm.

Tolerans	Avstånd
25H9	0000 +0052
30H11	0000 +0130
25f8	-0020 -0053

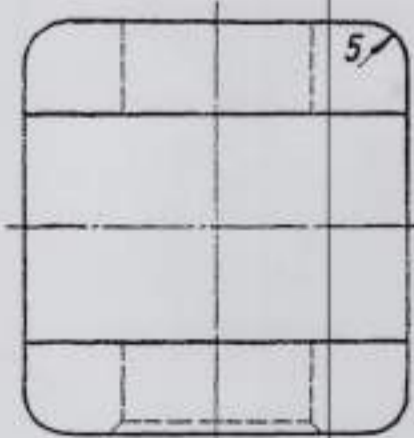


NOTE :-  
 CHROMIUM PLATE SURFACE  
 D = 25f8 AND D = 22 INCLUDING 15° TAPER  
 THICKNESS OF CHROMIUM PLATE = 0.05.

DIA BEFORE CHROMIUM PLATING MAX 24.93

DIA BEFORE CHROMIUM PLATING MIN 21.93

For SP-5 Drill at assembly



ALT MATL :- BS: 970 (PART-1) - 1983 GRADE 070 M55 (NORM) LRS 63

SURFACE TREATMENT:- HARD CHROMIUM PLATED

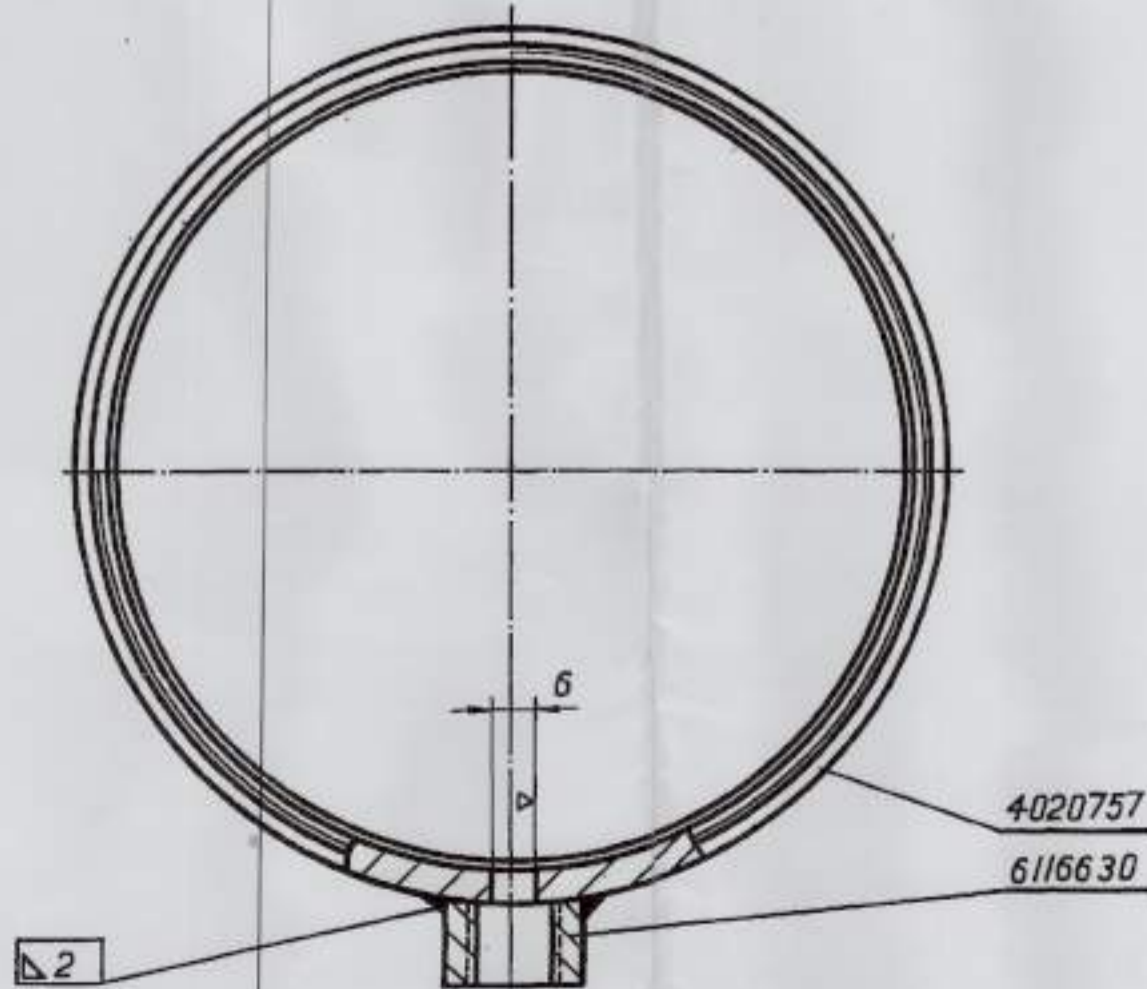
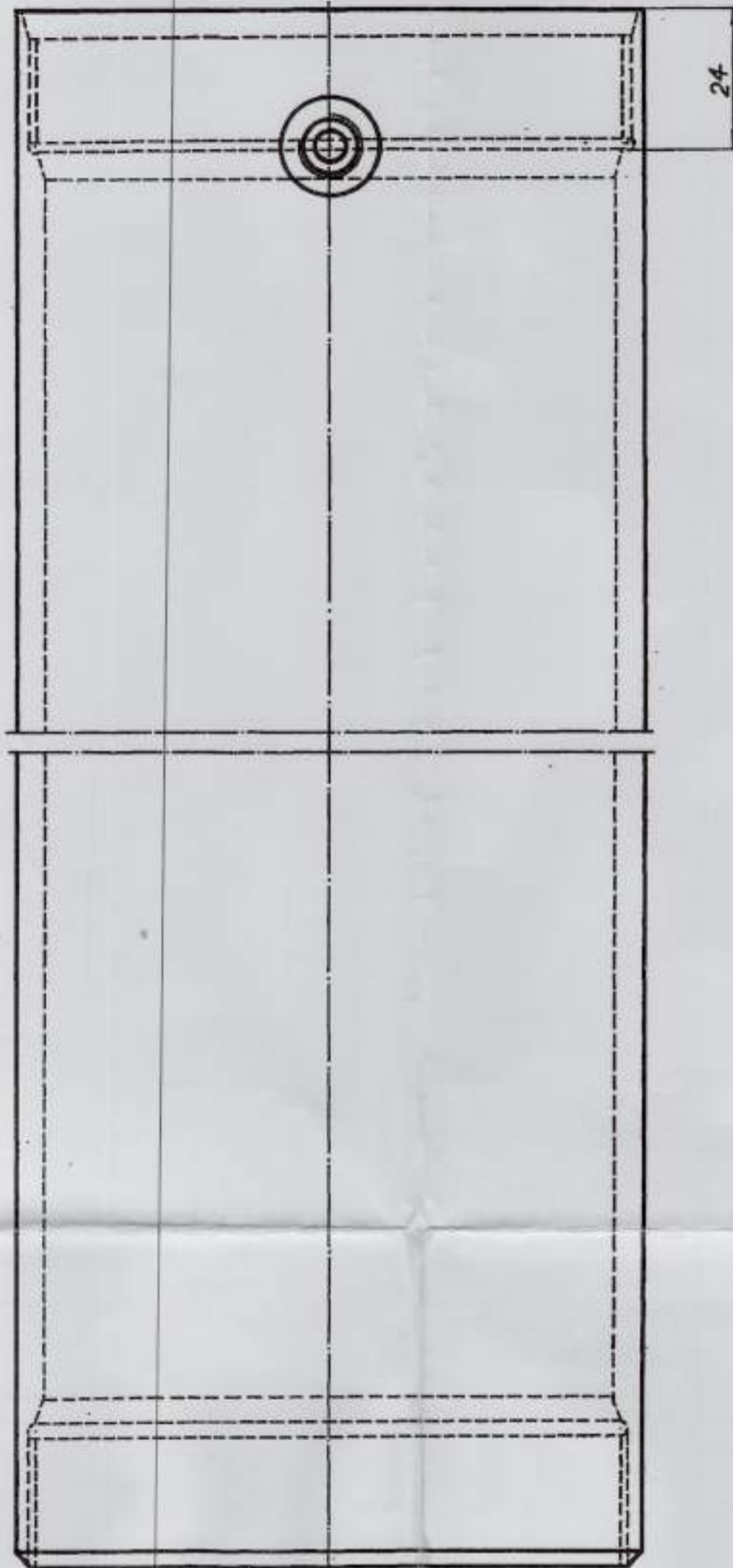
16-5-16	19503-W	ALT MATL AMENDED		
12-5-16		SCANNED & PRINTED WITHOUT CHANGE		
DATE	AUTHORITY	AMENDMENTS	SIG	SIG
			AHSP	DO
PREV DC :- 7518-W, 7851-W, 9668-W, 13503-W, 18883-W & 19209-W DT 22-03-11				
DRG SEALED PROV. 7518-W DT 26-12-59				
SCANNED :- MK		CHECKED :-		
CQA (W), JABALPUR				

4020756				Rod		Hard chromium plated	
5-938				AA		B/D	
6/1				223-49		2.3	
7/1				1/1			
DF	N	Group	DF	N	Group	Tilk	rtm



FOR EXPLANATION OF DIMENSIONING, ETC., SEE CIARM NOTE SHT No 1  
FIRST ANGLE PROJECTION DIMENSIONS ARE IN MILLIMETRES

Andr. nr	Andring	Begård av	Datum	Signatur	Tolerans	Avmätt
7518-W	DRG SEALED PROV					
26-12-59						
18883-W	HINDI NOMEN					
29-9-04	ADDED					
18883-W	HINDI NOMEN					
29-9-04	ADDED					



DILAPIDATED CL NEG REPLACED  
 CHECKED CHIEF DRAWING  
 HANDED BY  
 DO  
 AHSF

एक्सल गेयर फ्रन्ट सिलिन्डर वेल्डिंग

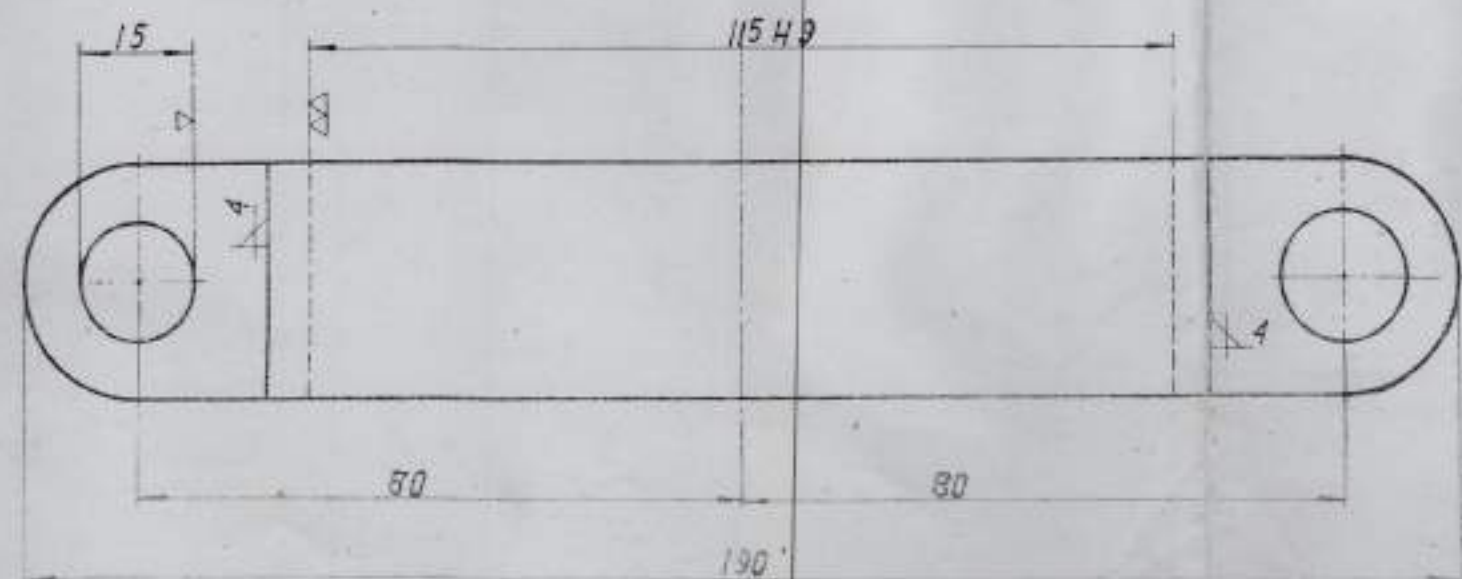
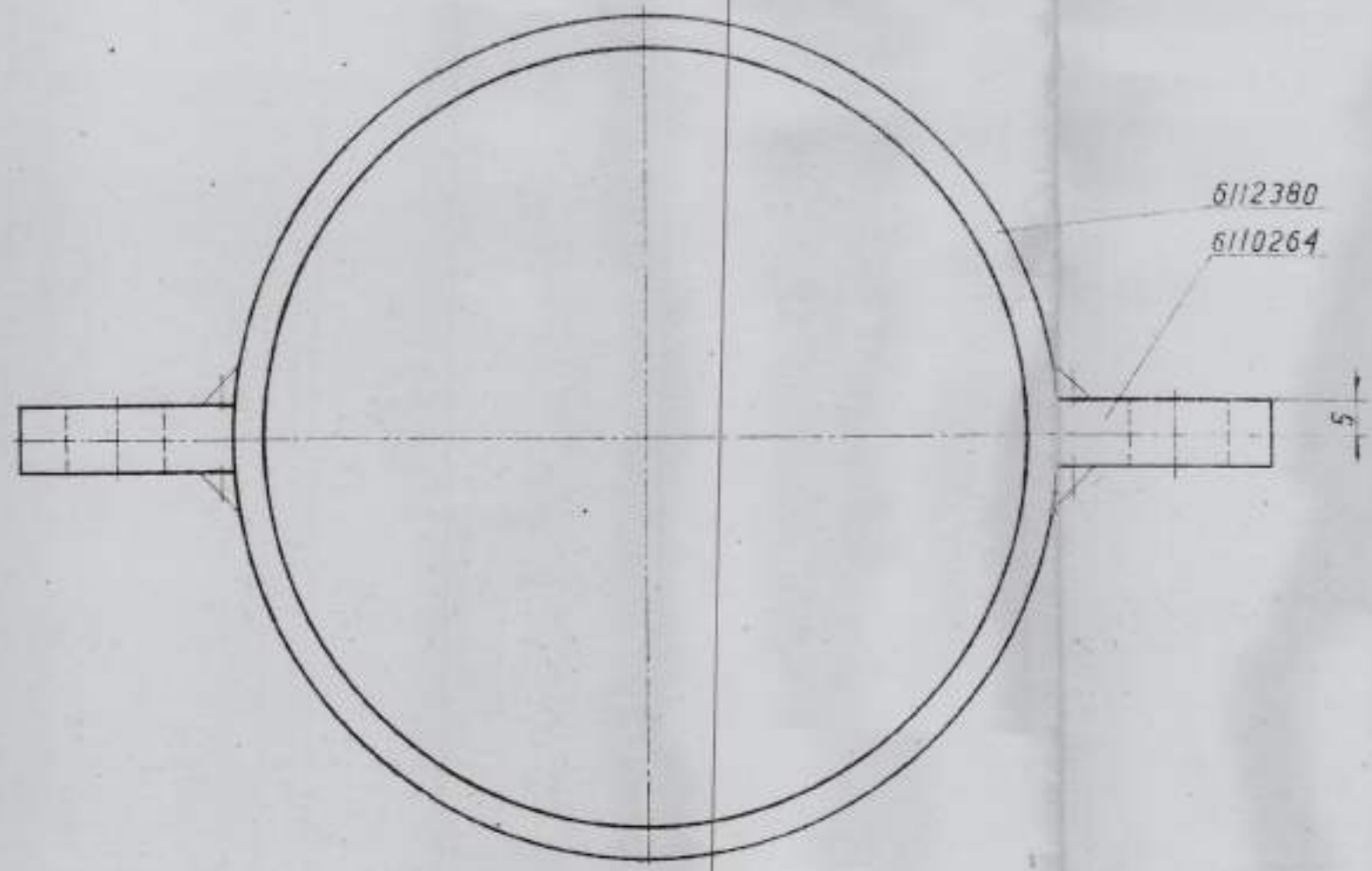
Titel	Kontr.	Datum	Skala	4021141
40 MM A.A. GUN L/70 Axle raising gear, front Cylinder. Welding		26-1.50	1:1	
Bofors ägarerätt till denna ritning är skyddad genom lagen av den 30 maj 1919. Konstruktionen eller ritningen får ej utan bolagets medgivande bekantgöras, kö- peras eller mångfaldigas, bringas till utförande eller i övrigt obehörigen utnyttjas.				5-938 5/1 7/1 DF
-B- AKTIEBOLAGET BOFORS -B-				

E  
N

FOR EXPLANATION OF DIMENSIONING, ETC, SEE CIARM NOTE SHEET No 1  
 FIRST ANGLE PROJECTION DIMENSIONS ARE IN mm

7518-W DRG SEALED PROV  
 26-12-59  
 18883-W HINDI NOMEN ADDED  
 29-09-04

11549 0.000  
 +0.067



\* एक्सल रैसिंग गियर फ्रन्ट  
 ब्रैकेट वेल्डिंग एन्ड मशीनिंग

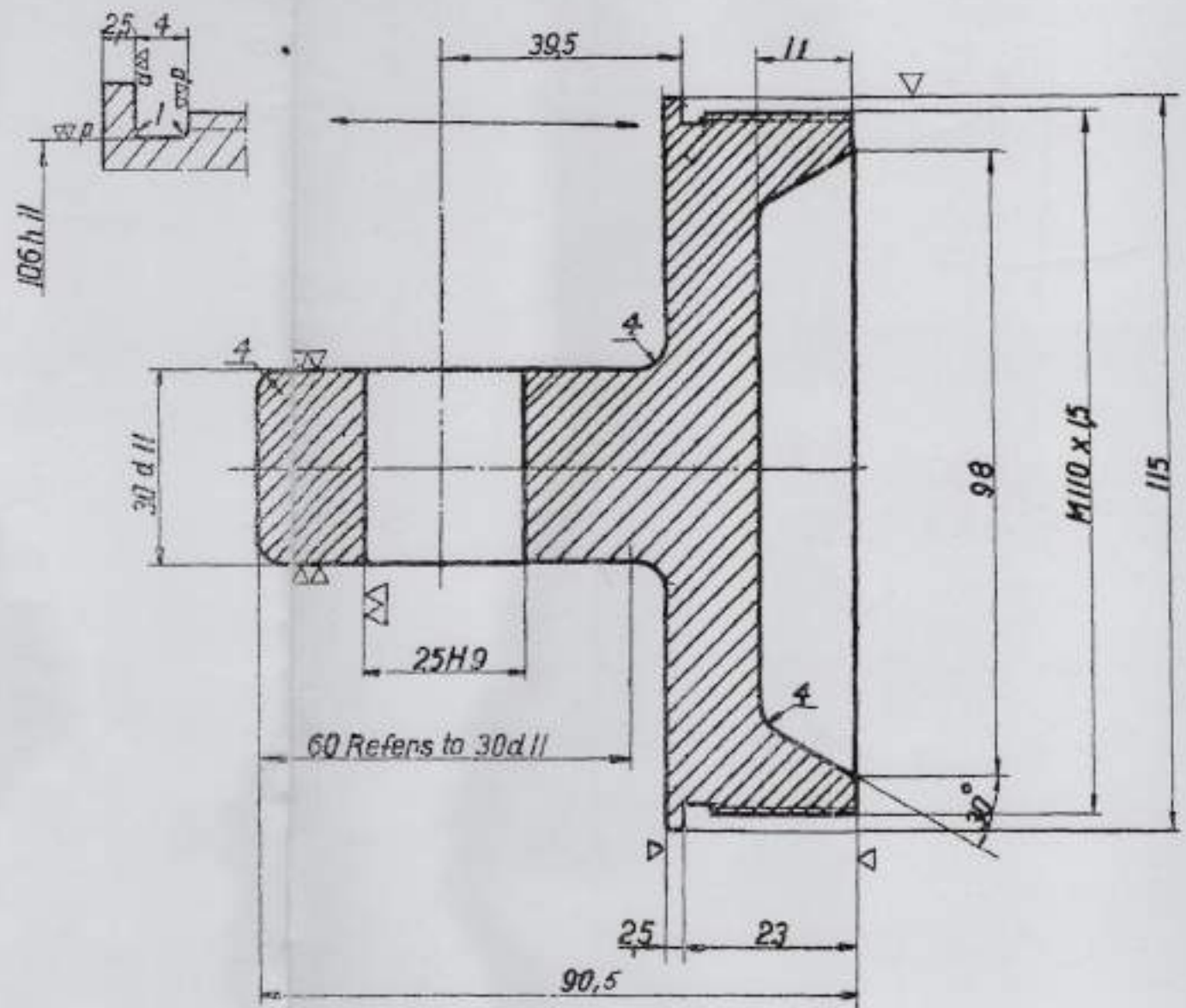
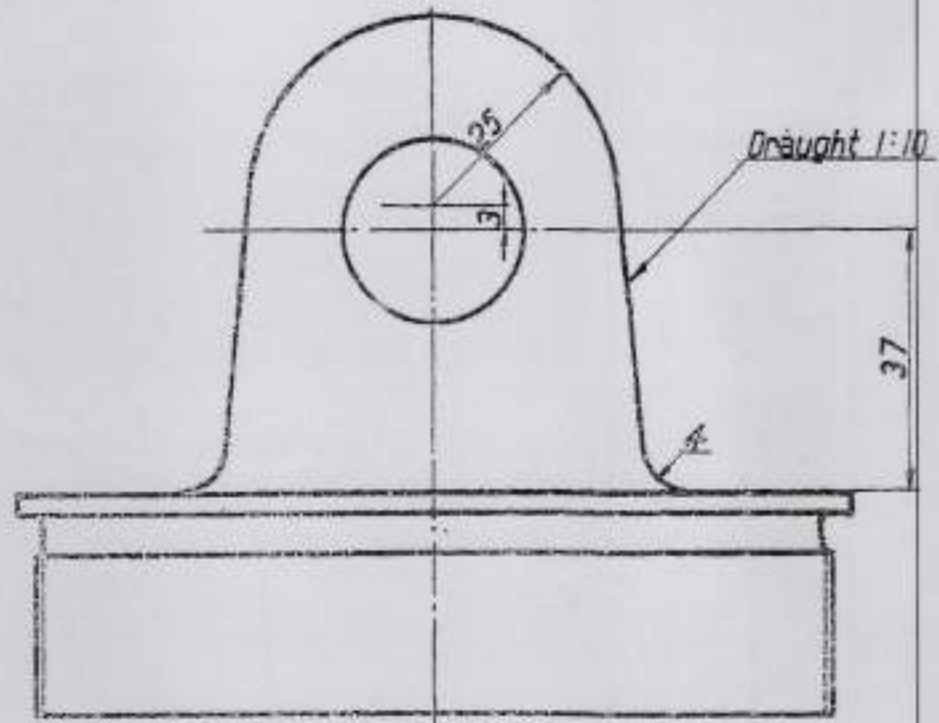
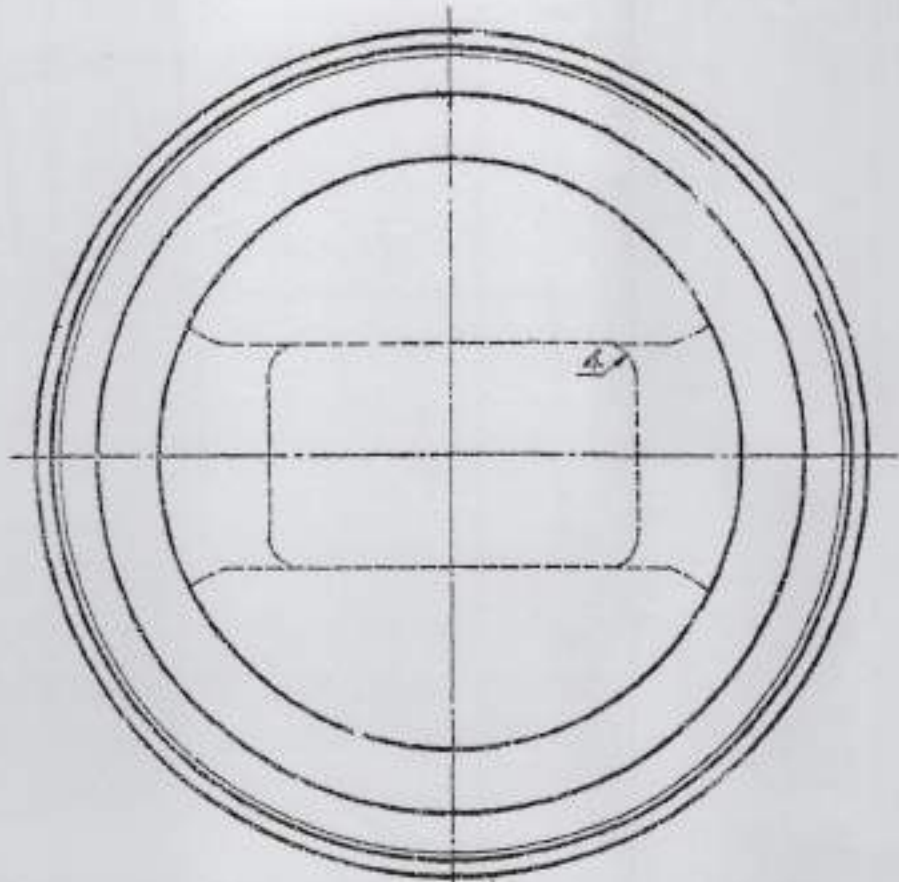
SURFACE TREATMENT TO SPEC Y 050

40 MMA A GUN L/70				5-938
* Axle raising gear front				6/1, 7/1
Bracket Welding and machining				
DT	DATE	DM	SCALE	
Dgs	31	22-3-43	1:1	5051452

25-3-79  
 DILAPIDATED CLOTH NEG REPLACED  
 CHECKED CHIEF D/MAN  
 AHSP

F

FOR EXPLANATION OF DIMENSIONING ETC., SEE CIARM NOTE SHT No. 1  
FIRST ANGLE PROJECTION. DIMENSIONS ARE IN mm.



Tolerans	Avmät
25H9	0.000 +0.052
30d11	-0.065 -0.195
106h11	0.000 -0.220

MATERIAL IN INDIA :-  
BS: 970, PART 1; 1983, GRADE 150 M 36, CONDITION 'R'  
SURFACE TREATMENT TO SPEC Y 050

7-12-10	SCANNED AND PRINTED WITHOUT CHANGE			SIG AHSP	SIG DO
DATE	AUTHORITY	AMENDMENTS			
PREV DCs 7518-W, 18883-W & 19150-W DATED 19-12-08					
DRG SEALED PROV:-		SCANNED	CHECKED	HOS	
7518-W DATED 26-12-59		MY	GSN		

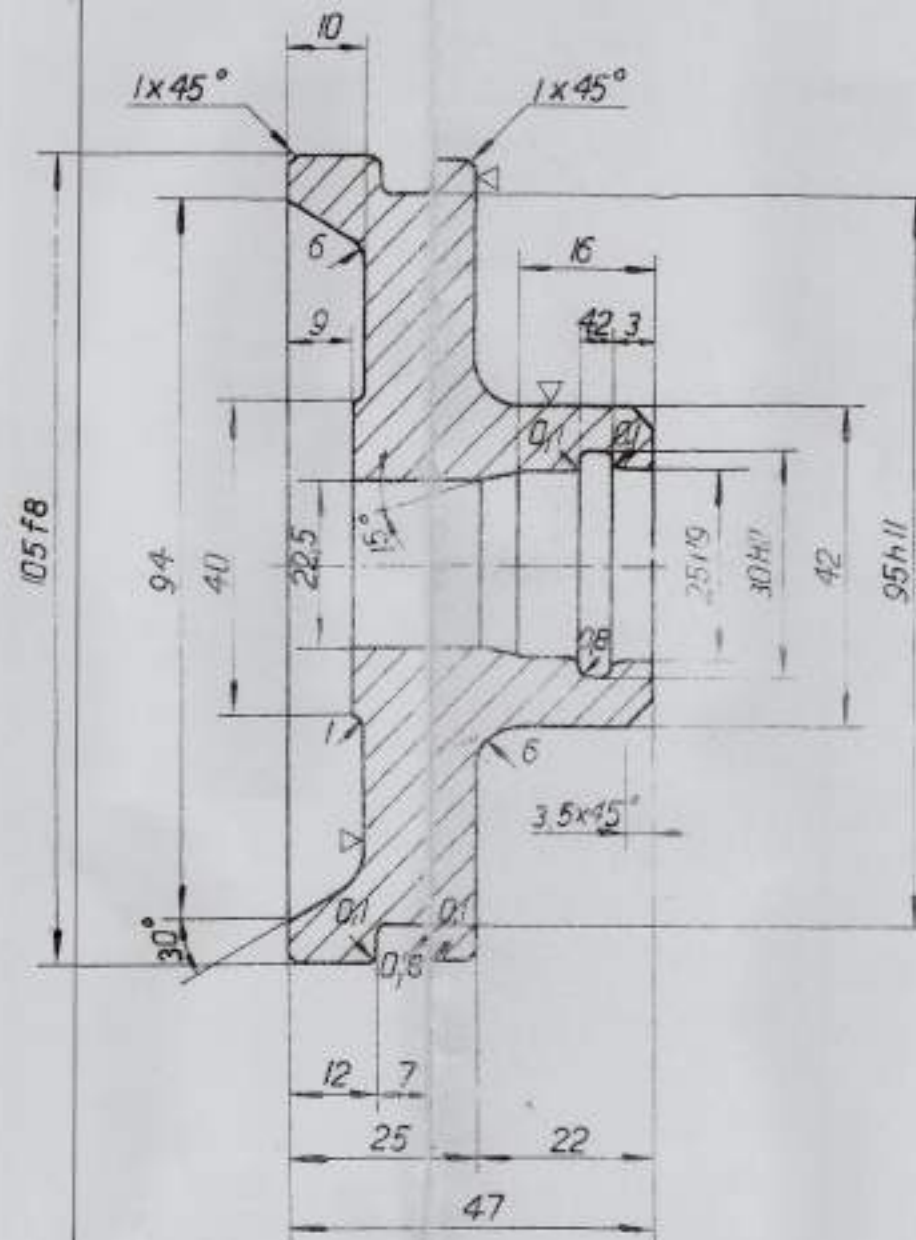
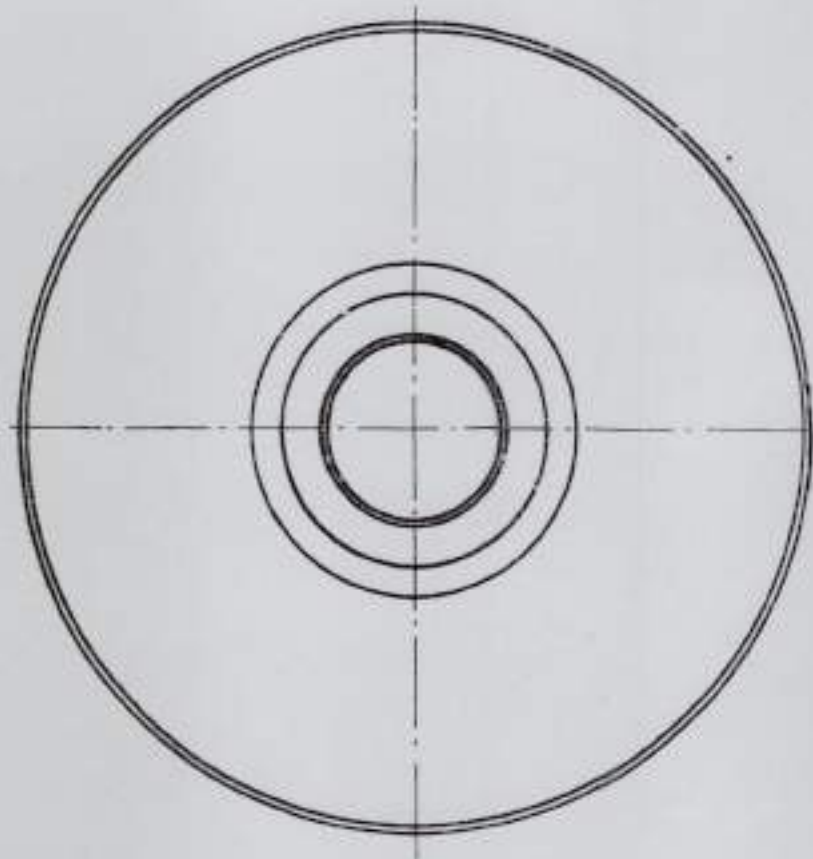
CQA(W), JABALPUR

				Cover				HK-4187	
				Cover				Verkt.nr	
				5-938				2-1	
				40 MM AA GUN L/70				Verkt.nr	
				Axle raising front gear rear				2-1	
				6/2				Verkt.nr	
				7/2				2-1	
				Dag 22-3-59 1/1				5051455	
DF- Nr	Grupp	DF- Nr	Grupp	Föreg. ritn.	Tillk. ritn.				
AB Bofors äganderätt till denna ritning är skyddad genom lagen av den 30 maj 1919. Konstruktionen eller ritningen för sig utgör bolagets medgivande beaktas, kopieras eller mångfaldigas, bringas till stånd eller i öfrigt obehörigen utnyttjas.									
-B- AKTIEBOLAGET BOFORS -B-									



FOR EXPLANATION OF DIMENSIONING ETC., SEE CIARM NOTE SHT No. 1  
FIRST ANGLE PROJECTION. DIMENSIONS ARE IN mm

Tolerance	Avvik
25H9	0,000 +0,052
30H11	0,000 +0,130
105f8	-0,036 -0,090
95h11	0,000 -0,220



INDIAN REFERENCES	
DESIGN No.	----
PART No.	----
DESIGNATION	HEAD

MATERIAL IN INDIA :- BS EN 12163 DESIGNATION  
CW 307 G CONDITION R 680

8-8-16	19519-W	MATL IN INDIA AMENDED		
19-2-11		SCANNED & PRINTED WITHOUT CHANGE		
DATE	AUTHORITY	AMENDMENTS	SIG AHSP	SIG DO
PREV DCs: 7518-W, 7662-W, 9425-W, 12893-W, 15358-W & 18883 DATED 29-09-04				
DRG SEALED PROV :- 7518-W DATED 26-12-59		SCANNED MK	CHECKED AKJ	HOS

		40 MM AA SUN L/70 Axle raising gear front rear		Head हेड		BML21		Verkt.nr 1.4	
5-938		6/2		Benämning		Material		Behandl. Ser. vikt kg.	
7/2		7/2		Ritad	Kontr.	Datum	Skala	5073586	
				Dgs	Zo	1-9-54	1:1		
				Färg. rit.		Tillk. rit.			

CQA(W). JABALPUR

AKTIEBOLAGET BOFORS





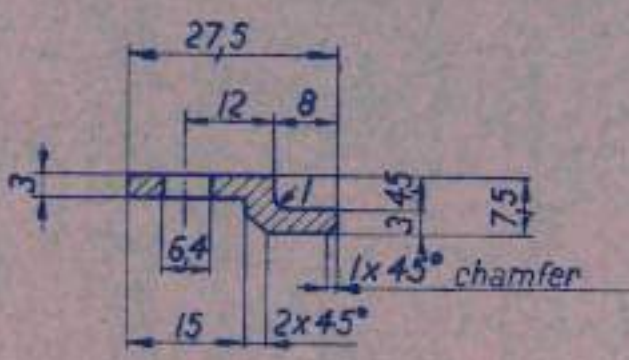
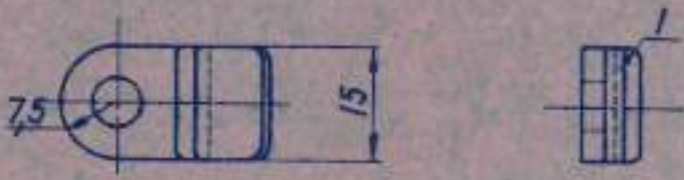
Andr. nr	Ändring	Begärd av	Datum	Signatur	Tolerans	Avmå.
7518-W 26-12-59	ORG SEALED PROV					
PREV DC No: 12293-W 23-12-58						
18883-W 29-09-04	HINDI NOMEN ADDED			<i>Handwritten signature</i>		

FOR EXPLANATION OF DIMENSIONING, ETC., SEE CIARM NOTE SHT No 1  
FIRST ANGLE PROJECTION DIMENSIONS ARE IN MILLIMETRES

21-10-77	19619-W	MATL. AMENDED
18-04-18	19657-W	NOMENCLATURE AMENDED

*Handwritten notes:*  
15.01.80  
20.9.18  
*Handwritten signature*

27-12-78	Checked <i>K. Noid</i>	Chief D'Man <i>K. Noid</i>	DO <i>Handwritten initials</i>	AHSP <i>Handwritten signature</i>
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ALT. MATL.

BS: 970 Part 1: 1983 Gde 070M20  
OR  
IS: 2062-2011 Gde E 250 A

ALT. MATL.

~~BS 1449 PT 2 A HR 23~~

SURFACE TREATMENT TO SPEC Y 053

PLATE LOCKING PISTON JOINT PIN

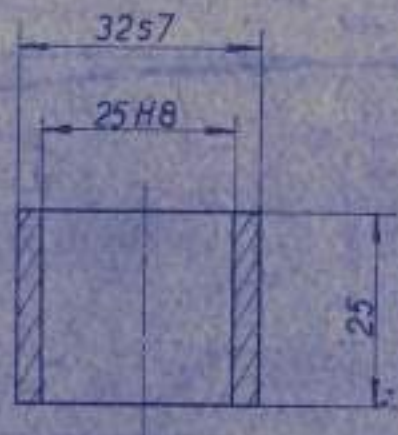
5-938	40 MM AA 5UN L/70	Plate	B4	Verkt. nr 0,01
6/4	Axle raising gear front rear	Benämning	Material	Behandl.
7/4		Ritad	Kopier.	Datum
		Dgs.	29. 9-11-48	Skala 1:1
DF	Nr	Grupp	DF	Nr
			Föreg. ritn.	Tillk. ritn.

**6108932**

AB Bofors äganderätt till denna ritning är skyddad genom lagen av den 30 maj 1919. Konstruktionen eller ritningen får ej utan bolagets medgivande bekantgöras, kopieras eller mångfaldigas, bringas till utförande eller i öfrigt obehörigen utnyttjas

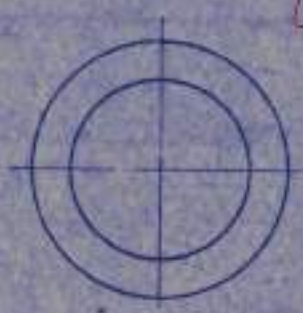
Andr. nr	Ändring	Beord. av	Datum	Signatur	Tolerans	Avskrift
7518-W 26-12-59	DRG SEALED DROV				25 H8 32s7	0,000 +0,033 +0,068 +0,043
18883-W 29-9-04	HINDI NOMEN ADDED			<i>K. S. M.</i>		

FOR EXPLANATION OF DIMENSIONING, ETC., SEE CIARM NOTE SHT No 1  
FIRST ANGLE PROJECTION DIMENSIONS ARE IN MILLIMETRES



BS 1400 FBI (DR) CASTING EN 1982/1998 - CC 482 K-08  
OR 15-28-1985 GRADE 2, SAND CAST

ALT MATL:-  
BS 1400 FBI

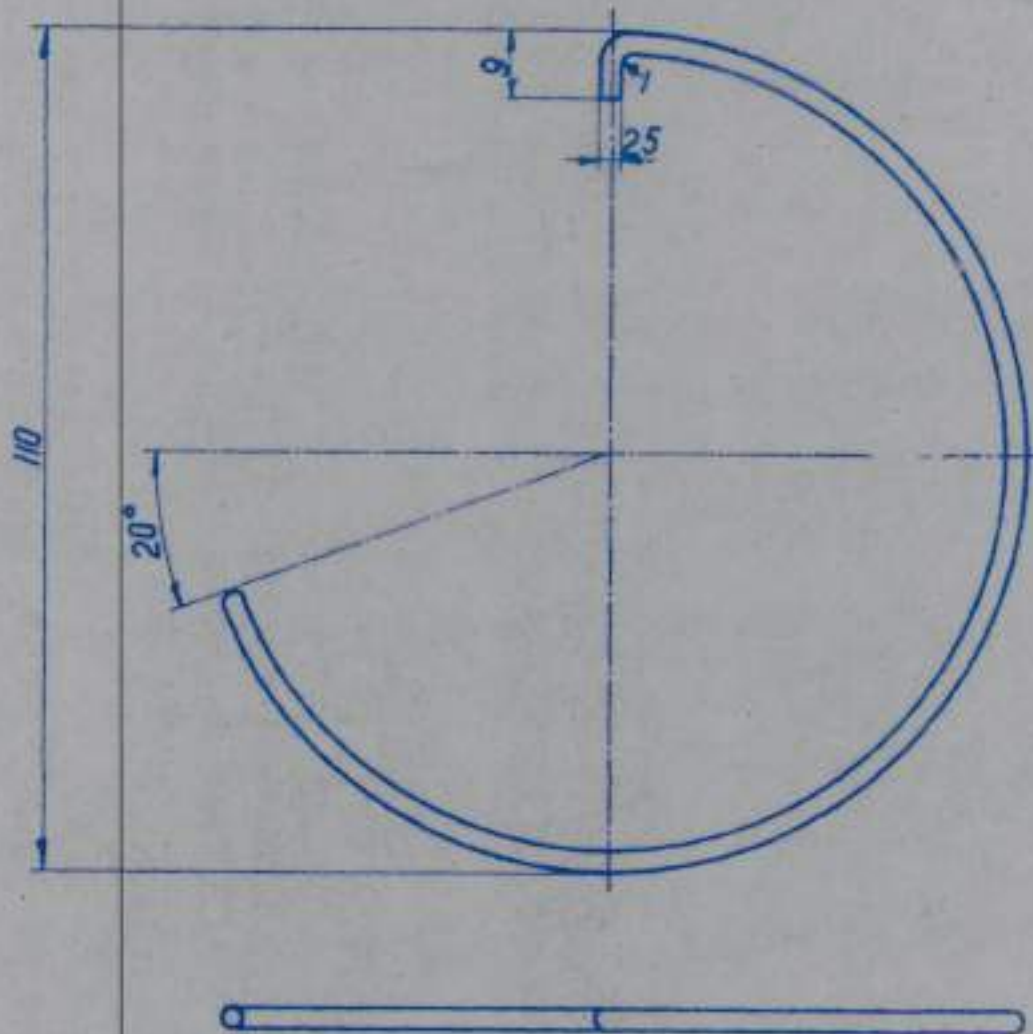


27-12-78	Checked	CHIEF D'MAN	DILAPIDATED CLOTH NEGATIVE REPLACED
	<i>K. S. M.</i>		

Grupp	Di	H	Grupp	Form	Material	Standard	Verkt.nr
5-938	614	7/4	40MM A A GUN L/70 Axle raising gear front rear	Bush	BML13		0,07
							6112379

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FOR EXPLANATION OF DIMENSIONING ETC SEE CIARM NOTE SHT No. 1  
 FIRST ANGLE PROJECTION. DIMENSIONS ARE IN mm.



ALT MATL :- BS 5216-1975 HD 3 BS: 5216-1975, ND3 OR DEF 106  
 OR  
 DEF 106 IS: 2507-1975 GRADE 9 DESIGNATION 55Si7  
 SURFACE TREATMENT TO SPEC Y 05+ Y 3-11

05-01-2018	18840-W	ALT. MATL, SURFACE TREATMENT AMENDED		
7-6-10		SCANNED & PRINTED WITHOUT CHANGE		Chait
DATE	AUTHORITY	AMENDMENTS	SIG AHSP	SIG DO
PREV DCs :- 7518-W, 11975-W, 16106-W & 18883-W DATE 29-9-04				
DRG SEALED PROV :- 7518-W DT 28-12-59		SCANNED - PKA	CHECKED :- RR Vaj	HOS :-

CQA(W) JABALPUR

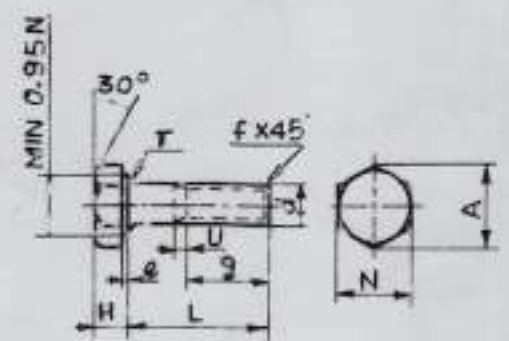
		5-938	40 MM	Clip	विलय	Spring steel				Verkt.-nr
		6/4	AA GUN	Benamning		Material	Behandl.	Ber. vikt kg		
		7/4	L/70	Ritail	Kontr.	Datum	Skola	6112382		
			Axle raising gear front rear	Dgs	22-3-98	N				
DF	Nr	Grupp	DF	Nr	Grupp	Föreg. ritn	Följ. ritn			

AB Bofors ogönderatt denna ritning är skyddad genom lagen av den 30 maj 1919. Konstruktionen eller ritningen får ej utan bolagets medgivande bekantgöras, kopieras eller mångfaldigas, bringas till utförande eller öfrigt obehörigen utnyttjas.



8	7	6	5	4	3	2	1
PART No.		DIMENSIONS ARE IN mm.					
N2-71							

AKTIEBOLAGET <b>BOFORS</b>	
16-14-1	
In	BLAD NR 1
	PORTS PA BLAD NR



DESIGNATION - B6LS-d x L D80  
(PREVIOUS DESIGNATION BOFO-80-d x L)  
EXAMPLE - B6LS-6 x 35 D80

- G=WEIGHT OF HEAD IN GRAMMES
- U=THREAD RUN OUT
- X=FULL THREADED SCREW
- MANUFACTURED IN TOLERANCE CLASS 1, COLD PRESSED,
- SEE TABLE N2-82
- MATERIAL IN DURABILITY CLASS D80
- DIMENSIONS CONFORM WITH SMS 1414
- UNDERLINED DIMENSIONS EX AB BOFORS STOCK
- "GALVANISING TO BOFORS SPECIFICATION Y054"

G	0.2	0.4	0.9	2.0	2.6	7.7	13.5	20	28	35	75	112
N	4	5	7	8	10	12	15	18	21	24	30	34
A	4.6	5.8	8	9.2	11.5	13.8	17.3	20.8	24.2	27.7	34.6	39.2
H	16	2	2	3.5	4.2	5.5	7	8	9	11	13	16
e				0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5
f	0.4	0.5	0.8	0.8	1	1.2	1.5	2	2	3	2.5	3
r	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.8	1	1.5
d	2.3	3	4	5	6	8	10	12	14	16	20	24

L	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
4	x 4	x 6	x 8	x 10	x 12	x 14	x 19	x 16	x 25	x 35	x 50	x 50	x 50	x 50	x 50	x 50	x 50	x 50
5	x 5	x 8	x 10	x 12	x 14	x 16	x 22	x 19	x 30	x 40	x 50	x 50	x 50	x 50	x 50	x 50	x 50	x 50
6	x 6	x 10	x 12	x 14	x 16	x 19	x 25	x 22	x 35	x 45	x 60	x 60	x 60	x 60	x 60	x 60	x 60	x 60
8	x 8	x 12	x 14	x 16	x 19	x 22	x 30	x 25	x 40	x 50	x 65	x 65	x 65	x 65	x 65	x 65	x 65	x 65
10	8 10	x 14	x 16	x 19	x 22	x 25	x 35	x 30	x 45	35 55	40 70	50 50	50 50	50 50	50 50	50 50	50 50	50 50
12	8 12	x 16	x 19	x 22	x 25	x 30	x 40	30 35	30 50	35 60	40 75	50 50	50 50	50 50	50 50	50 50	50 50	50 50
14	8 14	x 19	16 22	x 25	19 30	22 35	25 35	25 30	30 40	30 55	35 65	40 80	50 50	50 50	50 50	50 50	50 50	50 50
16	8 16	12 22	16 25	19 30	19 35	22 40	25 50	30 45	30 60	35 70	40 85	50 100	50 50	50 50	50 50	50 50	50 50	50 50
19	8 19	12 25	16 30	19 35	19 40	22 45	25 55	30 60	30 70	35 80	40 90	50 100	50 50	50 50	50 50	50 50	50 50	50 50
22	8 22	12 30	16 35	19 40	19 45	22 50	25 60	30 70	30 80	35 90	40 100	50 110	50 50	50 50	50 50	50 50	50 50	50 50
25	8 25	12 35	16 40	19 45	19 50	22 55	25 65	30 75	30 85	35 95	40 110	50 120	50 50	50 50	50 50	50 50	50 50	50 50
30	8 30	12 40	16 45	19 50	19 55	22 60	25 70	30 80	30 90	35 100	40 120	50 130	50 50	50 50	50 50	50 50	50 50	50 50
35	8 35	12 45	16 50	19 55	19 60	22 65	25 75	30 85	30 95	35 105	40 130	50 140	50 50	50 50	50 50	50 50	50 50	50 50
40	8 40	12 50	16 55	19 60	19 65	22 70	25 80	30 90	30 100	35 110	40 140	50 150	50 50	50 50	50 50	50 50	50 50	50 50
45	8 45	12 55	16 60	19 65	19 70	22 75	25 85	30 95	30 105	35 115	40 150	50 160	50 50	50 50	50 50	50 50	50 50	50 50
50	8 50	12 60	16 65	19 70	19 75	22 80	25 90	30 100	30 110	35 120	40 160	50 170	50 50	50 50	50 50	50 50	50 50	50 50
55	8 55	12 65	16 70	19 75	19 80	22 85	25 95	30 105	30 115	35 125	40 170	50 180	50 50	50 50	50 50	50 50	50 50	50 50
60	8 60	12 70	16 75	19 80	19 85	22 90	25 100	30 110	30 120	35 130	40 180	50 190	50 50	50 50	50 50	50 50	50 50	50 50

29-304	18883-W	HINDI NOMEN ADDED	
29-591		RETRACED WITHOUT CHANGE	
		PREV DC I Nos. 7507-W, 9517-W, 10481-W, 10690-W, 11794-W, 14268-W, 15205-W & 17050-W. DT. 11-4-91	
DATE	AUTHORITY	ZONE	NATURE
			SIG AHSP SIG DO

DRN:-	CHD:-	ASSY DRG:-	CQA(W) JABALPUR
TCD:- P.D.S AMAD	CHD:-	DATE:-	
CHIEF D' MAN	AHSP DO FOR CQA(W)	SCALE -	
		STD MASS:-	

AMENDMENTS	MATL STEEL BS 970 PART 1: 1983 605 M36	DESIGN NO.
DRG. SEALED PROV:- DC (I) No. 7507-W DT. 22-12-59 DO CQA(W)	PROTECTIVE FINISH:-	PART No

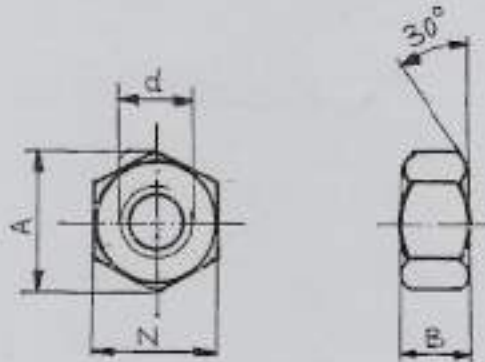
**SCREWS** स्कूज हेक्जागोनल, पॉलिशड, स्मॉल ग्रिप  
**HEXAGONAL, POLISHED, SMALL GRIP** टाईप : बी 6 एल एस स्म-  
**TYPE: B6LS, M-THREAD AS PER N2-1** थ्रेड सेज पर सन 2-1

<b>N2-71</b>
DS CAT No.

AKTIEBOLAGET  
**BOFORS**  
STANDARD  
MASKINELEMENT

NUTS HEXAGONAL, POLISHED In  
SMALL GRIP TYPE: B 6 LM,  
M-THREAD AS PER N2-1  
नट्स हेक्जागोनल, पॉलिश्ड स्माल ग्रीप  
टाइप: बी 6 एल एम, एम-थ्रेड ऐस पर एन 2-1

TABELL  
N 3-20  
REGD  
15 15 2  
BLAD NR FORTS PA  
BLAD NR 1



d	N	A	B	WEIGHT GRAMS
2.3	4	4.6	2.3	0.2
3	5	5.8	3	0.5
4	7	9.1	3.5	9.8
<u>5</u>	8	9.2	4	1.2
<u>6</u>	10	11.5	5	2.4
<u>8</u>	12	13.8	6	3.8
<u>10</u>	15	17.3	8	7.8
<u>12</u>	18	20.6	10	14
<u>14</u>	21	24.2	12	23
<u>16</u>	24	27.7	14	34
<u>20</u>	30	34.6	18	71
<u>24</u>	34	39.2	22	101

DESIGNATION :- B 6 LM-d D 80 (PREVIOUS DESIGNATION BUFO-6M-d)

EXAMPLE :- B 6 LM-12 D 80

GALVANISING TO BOFORS SPECIFICATION Y0 54

MANUFACTURED IN TOLERANCE CLASS 1, SEE TABLE N2-82

MATERIAL IN DURABILITY CLASS D 80

DIMENSIONS CONFORM WITH SMS 1427

UNDERLINED DIMENSIONS EX AB BOFORS STOCK

ALT. MATL. :- STEEL B5:970 Pt 1:1988, 605 M 36(S), HB 210-270

AHSP  
DO  
C/D MAN  
CHECKED  
TRACED

29-9-04	18883-W	HINDI NOMEN ADDED		
11-7-98		RE TRACED WITHOUT CHANGE.		
		PREV. DC Nos. 7507-W, 9517-W, 14268-W & 17413-W/DT. 3-10-92		
DATE	AUTHORITY	NATURE	SIG DO	SIG AHSP
DRG SEALED PROV. :- 7507-W/DT-22-12-59.				

EDITION	1	2	3	4	5	6	7	8	9	10
	6/44	10/51	6/54	8/55						

AKTIEBOLAGET

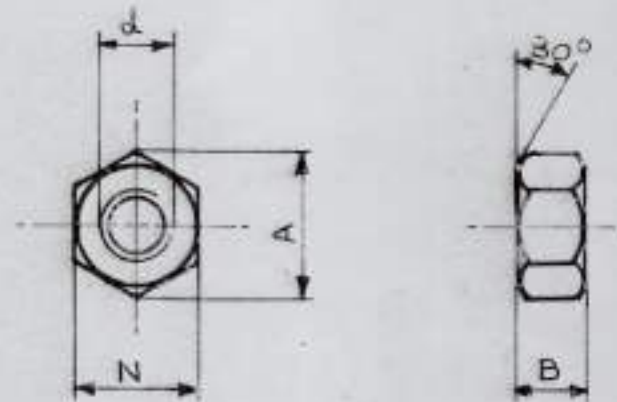
BOFORS

**NUTS**  
**HEXAGONAL POLISHED LARGE GRIP**  
**TYPE: B6 M, M-THREAD AS PER N2-1**

REG 16 15 2  
 GR 21 **N3-7**  
 DATUM 1-4-1948  
 BLADNR 1 FORTS PA  
 BLAD NR

*ln*

8-10-92  
*K. Andersson*  
 TRACED  
 CHECKED  
 C/D'MAN  
 DO  
 AHSP  
 RETRACED WITHOUT CHANGE



DESIGNATION : B6 M-d  
 EXAMPLE : B6 M-8

ALT MATL: STEEL, BS 970, Pt. 1: 1983, 080 M40 (NORM)  
 GALVANISING TO BOFORS SPEC Y 053

MANUFACTURED IN TOLERANCE CLASS 1-SEE TABLE N2-82  
 MATERIAL IN DURABILITY CLASS D60  
 DIMENSIONS CONFORM WITH SMS-1425  
 UNDERLINED DIMENSIONS EX AB BOFORS STOCK.

<u>d</u>	N	A ≈	B	WEIGHT GRAMS
<u>3</u>	6	6.9	3	0.6
<u>4</u>	8	9.2	4	1.6
<u>5</u>	9	10.4	5	1.8
<u>6</u>	11	12.7	6	3.5
<u>8</u>	14	16.2	8	7.3
<u>10</u>	17	19.6	10	13.1
<u>12</u>	22	25.4	12	27.7
<u>14</u>	22	25.4	14	29
<u>16</u>	27	31.2	16	52
<u>18</u>	32	36.9	18	86
<u>20</u>	32	36.9	20	88
<u>22</u>	36	41.6	22	124
<u>24</u>	36	41.6	24	126
<u>30</u>	46	53.1	30	266
<u>36</u>	55	63.5	36	456
<u>42</u>	65	75.0	42	762
<u>43</u>	75	86.5	48	1180

**E**  
 mars-50  
 329-n  
 febr-49

20.10.92	17427-W	ALT. MATL. AMENDED.	SIG - elP	
		PREV DC Nos. 7507-W, 9517-W, & 12314-W DATE: 7-1-69		
DATE	AUTHORITY	NATURE	SIG DO	SIG AHSP
PR. DRG SEALED PROV: DC No. 7507-W DATE: 22-12-59				
DO CQA(W)				



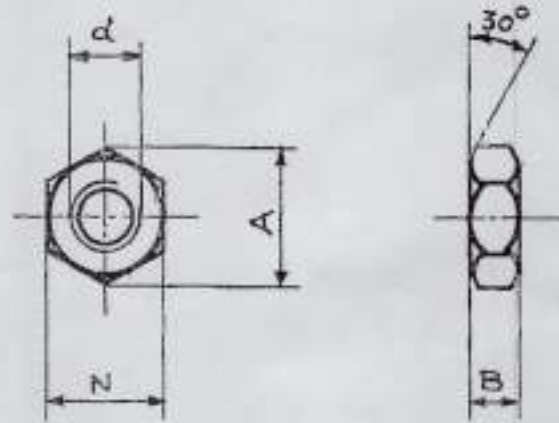
AKTIEBOLAGET  
BOFORS

नट्स, लो नट हाइट हेक्सागोनल,  
पोलिशड, लार्ज गिप  
टाइप: एल बी 6 एम, एम-थ्रेड  
एस पर एन 2-1

~~NUTS, LOW NUT HEIGHT~~ ~~HEXAGONAL, POLISHED, LARGE GRIP~~  
~~TYPE: LB6M, M-THREAD AS PER N2-1~~ *ln*

*NUT HEXAGONAL  
POLISHED LARGE GRIP*

REG 16 15 2  
GR 26 N3-9  
DATUM 1- 4-1948  
BLAD No. 1 FORTS PA  
BLAD NR



DESIGNATION :- LB6M-d

EXAMPLE :- LB6M-8

ALT MATL :- BS:970 Pt 1:1983, 080 M40 (NORM)

GALVANISING TO BOFORS SPEC Y053

MANUFACTURED IN TOLERANCE CLASS 1, SEE TABLE N2-82

MATERIAL IN DURABILITY CLASS D60

DIMENSIONS CONFORM WITH SMS-1429

UNDERLINED DIMENSIONS EX AB BOFORS STOCK

d	N	A ≈	B	WEIGHT IN GRAM
<u>3</u>	6	6.9	2	0.4
<u>4</u>	8	9.2	2.6	0.9
<u>5</u>	9	10.4	3	1.1
<u>6</u>	11	12.7	4	2.3
<u>8</u>	14	16.2	5	4.5
<u>10</u>	17	19.6	6	7.7
<u>12</u>	22	25.4	8	18.2
<u>14</u>	22	25.4	9	18.3
<u>16</u>	27	31.2	10	32
<u>18</u>	32	36.9	11	52
<u>20</u>	32	36.9	12	53
<u>22</u>	36	41.6	14	77
<u>24</u>	36	41.6	15	77
<u>30</u>	46	53.1	18	157
<u>36</u>	55	63.5	22	273
<u>42</u>	65	75.0	26	461
<u>48</u>	75	86.5	29	699

RETRACED WITHOUT CHANGE  
17-6-92  
SR SINGH TRACED  
G.P. Shukla CHECKED  
C/D MAN  
DO  
AHSP

28-04-18	19660-W	NOMENCLATURE AMENDED	
29-9-04	18883-W	HINDI NOMEN ADDED	
		PREV DC (I) Nos. 7507-W, 9517-W, 10608-W 13921-W-15667-W & 17161-W, Dt 5-12-91.	
DATE	AUTHORITY	NATURE	SIG DO SIG AHSP
DRG SEALED PROV :- DC(I) No. 7507-W			
DATE :- 22-12-59			cqa(w)

AKTIEBOLAGET  
BOFORS  
STANDARD

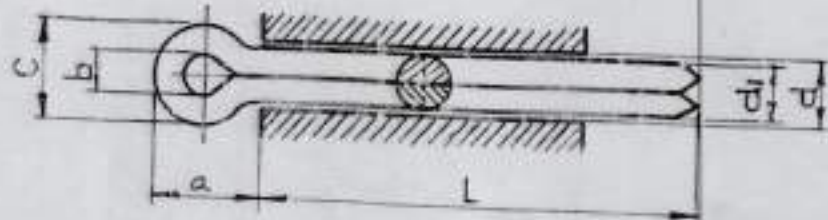
# PIN, COTTER SPLIT, TYPE: SP, METRIC

N 4 - 8

16 10 5

SIZES / n पिन, काटर स्प्लिट, टाइप: एसपी, मेट्रिक, स्टांडर्ड/इस

1



d = DIA OF HOLE FOR PIN

d	1	1.5	2	2.5	3	4	5	6	8	10	13	16
d h13	0.9	1.3	1.8	2.2	2.7	3.7	4.7	5.7	7.7	9.7	12.6	15.6
a ≈	3	3.5	4.5	5	6	8	10	12	15	19	24	30
b MAX	0.8	1.2	1.6	1.8	2	3	4	5	6	8	10	13
c ≈	1.7	2.5	3.4	4	4.7	6.7	8.7	10.7	13.7	17.7	22.6	28.6

LENGTH L

6	8	10	12	15	20	28	35	45	60	100	130
8	10	12	15	18	22	30	40	50	65	110	140
10	12	15	18	20	25	35	45	55	70	120	150
12	15	18	20	22	28	40	50	60	75	130	160
15	18	20	22	25	30	45	55	65	80	140	180
	20	22	25	28	35	50	60	70	90	150	200
	22	25	28	30	40	55	65	75	100	160	220
	25	28	30	35	45	60	70	80	110	180	240
	28	30	35	40	50	65	75	90	120	200	
	30	35	40	45	55	70	80	100	130	220	
		40	45	50	60	75	90	110	140	240	
			50	55	65	80		120	150		
				60	70			130	160		
								140	180		

NOTE:-

BEND TEST AS PER IS: 549

DESIGNATION: SP-d \* L

EXAMPLE: SP-8 \* 60

SURFACE TREATMENT TO Y 0 53

MATERIAL STEEL 1245 AS PER SIS 14 12,45 OR SIMILAR

MINOR DIFFERENCES IN THE SHANK LENGTH ARE PERMISSIBLE

DIMENSIONS CORRESPOND TO SMS 66

DIMENSIONS UNDERLINED \* AB BOFORS STOCK

ALT MATERIAL: STEEL BS 970 PART 1: 1983, 070 M 20.

OR

IS: 549: 1974

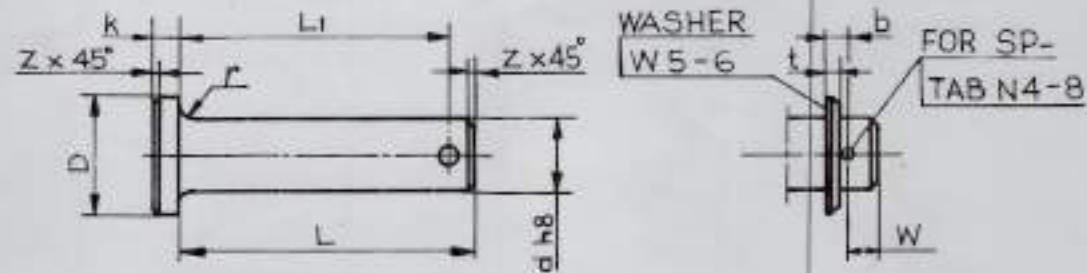
ALTERNATIVE PIN, COTTER, SPLIT TO IS 549: 1961

DULY ZINC PLATED TO IS 1573: 1970

13.8.90	RETRACED WITHOUT CHANGE	C/D MAN	29/09/04	18883-W	HINDI NOMEN ADDED		
			27-3-98	18429-W	ALT MATL AMENDED		
			5-12-91	17161-W	ALT MATL AMENDED.		
					PREV DC NOS: 7507-W, 10941-W, 11493-W, 11898-W, 12904-W, 14765-W, 15355-W, 15402-W, 15417-W & 16400-W DT 24-1-86		
	DATE	AUTHORITY	NATURE	SIG AHSP	SIG DO		
	DRG RESEALED: DC NO.1535-W			22.5.79	FOR CQA(W)		

UTARBOTAD KKD/	UTGAVA	1	2	3	4	5	6	7	8	9	10
FASTALID KKD/	MANAR	2/40	3/54								

PART No.  
**N4-9**



**NOTE:-**

N4-9-12 x 40 x 34 USED WITH IAN 5MA AND IAN 6MA WILL BE OF STEEL BS:970 Pt 1:1983, 708 M40 (U).

(A) ALT MATL:- BS:970-PART-1-1983, GRADE 080 M 50 (NORM) OR GRADE 070 M 55 (NORM)

GALVANISING TO BOFORS SPEC Y 053.

SPLIT PIN, TAB N4-8

DESIGNATION: N4-9-d x L (FOR PIN NOT DRILLED)

EXAMPLE: N4-9-8 x 25

DESIGNATION: N4-9-d x L x L1 (FOR DRILLED PIN)

EXAMPLE: N4-9-8 x 25 x 22

DIMENSIONS UNDERLINED EX AB BOFORS STOCK.

d	4	5	6	8	10	12	15	18	20	22	25	28	30	35	40
D	8	8	10	14	16	18	20	24	26	28	32	34	36	42	48
k	2	2	3	3	4	4	4	5	5	5	5	5	5	6	6
z	0.5	0.5	0.5	1	1	1.5	1.5	1.5	1.5	2	2	2	2	2	2
r	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	1	1	1	1	1	1	1
L	10	10													
	15	15	15	15											
	18	18	18	18	18	18									
	20	20	20	20	20	20									
	22	22	22	22	22	22	22								
	25	25	25	25	25	25	25								
	28	28	28	28	28	28	28	28							
	30	30	30	30	30	30	30	30							
	35	35	35	35	35	35	35	35	35						
	40	40	40	40	40	40	40	40	40	40					
	45	45	45	45	45	45	45	45	45	45	45				
	50	50	50	50	50	50	50	50	50	50	50	50			
			55	55	55	55	55	55	55	55	55	55	55		
			60	60	60	60	60	60	60	60	60	60	60	60	
			65	65	65	65	65	65	65	65	65	65	65	65	65
						70	70	70	70	70	70	70	70	70	70
							75	75	75	75	75	75	75	75	75
								80	80	80	80	80	80	80	80
								85	85	85	85	85	85	85	85
								90	90	90	90	90	90	90	90
								100	100	100	100	100	100	100	100
									110	110	110	110	110	110	110
										120	120	120	120	120	120
											130	130	130	130	130
												140	140	140	140
													150	150	150
SP-	1x8	1.5x8	1.5x10	2x15	2x15	3x20	4x25	5x30	5x30	5x30	6x40	6x40	6x40	8x50	8x60
w.min	1.5	2	2.5	3	4	5	5	6.5	6.5	6.5	8	8	8	10	10
b	1.5	1.75	2.25	2.5	3	3.5	4	4.5	5.5	5.5	6	7	7	9	9
t	1	1	1.5	1.5	2	2	2	2	3	3	3	4	4	5	5

19-12-08	19150-W		MATL. AMENDED.		
29-9-04	18883-W		HINDI NOMEN ADDED		
12-3-05			RETRACED WITHOUT CHANGE		
			PREV DC Nos :- 7507-W, 9517-W, 12314-W, 14004-W, 15302-W & 17321-W DT 19-6-92		
DATE	AUTHORITY	ZONE	NATURE	SIG AHSP	SIG DO
			AMENDMENTS		
DRG SEALED PROV :- DC No. 7507-W					
DT. 22-12-59				DO CQA(W)	

DRN :- CHD :- ASSY DRG :-  
TCD :- CHD :- DATE :-  
for Ashwaryad  
CHIEF D'MAN DO FOR CQA(W)  
MATERIAL :- AS SHOWN ABOVE  
PROTECTIVE FINISH :-

TAB-454  
**CQA(W) JABALPUR**  
  
DESIGN No.  
PART No.  
**N4-9**  
DS CAT No.

**PIN, JOINT**      **पिन, जॉइंट**

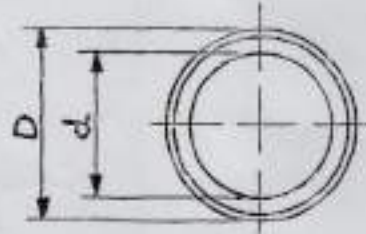


# WASHER JOINT PIN

वाशर जॉइन्ट पिन

TAB 455

N5-6



DESIGNATION:- N5-6-d x D  
EXAMPLE.- N5-6-10 x 16

TOLERANCES FOR  $d = +\frac{1T15}{2}$

SURFACE TREATMENT TO Y 053

ALT MATL.- STEEL BS 970 Pt 1 1983, 080 M 30 (NORMALISED)

THE WASHERS FIT BOLT N4-9

MATERIAL.- B7

UNDERLINED DIMENSIONS EX AB BOFORS STOCK

d	D	e	t
4	8	03	1
5	8	03	1
<u>6</u>	10	04	15
<u>8</u>	14	0.5	15
<u>10</u>	16	05	2
<u>12</u>	18	05	2
<u>15</u>	20	05	2
18	24	1	2
20	26	1	3
22	28	1	3
25	32	1	3
28	34	1.5	4
30	36	1.5	4
35	42	1.5	5
40	48	1.5	5

TRACED	si p shankar	DO	AHSP
CHECKED	si p shankar	DO	AHSP
C/D MAN	si p shankar	DO	AHSP
DO	si p shankar	DO	AHSP
AHSP	si p shankar	DO	AHSP

29 9 04	18883-W	HINDI NOMEN ADDED		
28-11-95		RETRACED WITHOUT CHANGE.		
		PREV DC No:-7507-W, 11493-W, 11885-W & 17413-W/DT. 3-10-92		
DATE	AUTHORITY	NATURE	SIG DO	SIG AHSP
DRG SEALED:- PROV DC No. 7507-W DT. 22-12-59			DO CQA(W)	

AKTIEBOLAGET

BOFORS

WASHER, SHAKEPROOF  
 TYPE: SHAKEPROOF METRIC SIZES  
 वाशर, शेकप्रूफ टाइप: शेकप्रूफ  
 मेट्रिक साइज

TABLE **N5-8**  
 REG 16 15 8  
 BLAD NR 1 FORTS PG BLAD NR  
 DATUM 22-5-1948

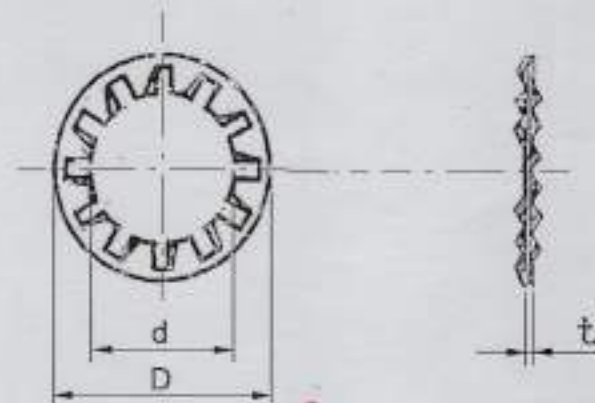


TABLE COLUMN 'd'

Against	DS CAT NO	NSN
(23.2)	5310-020988	5310-72-006-2405
(26.0)	5310-020989	5310-72-006-2406
(19.8)	5310-020987	5310-72-006-2404
(16.5)	5310-020986	5310-72-006-2403
(14.9)	5310-020985	5310-72-006-2402

DESIGNATION: N5-8-d  
 EXAMPLE: N5-8-11.6

SCREW		d	D	t
M	W			
3		3.3	6.3	0.4
	1/8"	3.7	8	0.45
4		4.4	8.8	0.45
	5/32"	4.4	8.8	0.45
5		5.1	10	0.55
	3/16"	5.1	10	0.55
6		6.1	10.2	0.6
	1/4"	6.6	12	0.6
		8.3	15.2	0.75
	5/16"	8.4	15	0.75
	3/8"	9.9	17.5	0.9
10		10.3	17.5	0.9
	7/16"	11.6	20	0.9
12		12.3	20	0.9
	1/2"	13.2	22	1.0
	9/16"	14.9	24	1.0
16		16.5	27	1.15
	5/8"	16.5	27	1.15
	3/4"	19.8	32	1.25
20		20.5	32	1.25
	7/8"	23.2	36	1.25
24		26.0	42	1.55
	1"	26.0	42	1.55

JSS: 0465-01: 1994 (ZINC PHOSPHATING) CLASS II  
 SURFACE TREATMENT TO Y 3-11  
 MATERIAL:- BS: 1449 PT 1: 1983 GDE CS 80 HARDNESS 420-470 HV  
 DIMENSIONS UNDERLINED EX AB BOFORS STOCK

DATE	AUTHORITY	AMENDMENTS	SIG AHSP	SIG DO
07-02-23	19815-W	TABLE COLUMN 'd' ADDED		
08-01-2018	19642-W	SURFACE TREATMENT AMENDED & COLUMN WEIGHT PER 1000 NO. IN GRAM APPROX. ALONG WITH ALL ENTRIES DELETED.		
04-10-12	19281-W	MATL. AMENDED.		
29-2-12	19244-W	UNDER TABLE IN LAST COLUMN (WEIGHT GRAM) AMENDED		
19-04-07		SCANNED & PRINTED WITHOUT CHANGE		
PREV DC :- 7507-W, 10991-W, 14784-W, 14985-W, 17417-W, 18416-W & 18883-W DATED 29-09-04				
DRG SEALED PROV: 7507-W DATED 22-12-69		SCANNED: MK	CHECKED: -/Vf.	
C Q A (W), JABALPUR				

Aktiebolaget  
**BOFORS**  
Standard  
Maskinelement



**O - RINGS**  
**GENERAL INSTRUCTIONS**

Tabell <b>N9-8</b>	
Rtg. 16 18 4	
Blad Nr	Porter Blad Nr
	2

7814-W  
9-2-61 **ORG SEALED PROV**

**DEFINITION**

The term "O-ring" implies a round form pressed, precision sealing ring with a circular cross section.

**THE GENERAL FUNCTION OF THE O-RING**

The principle for the function of the O-ring is that the ring is pressed together between surrounding metal surfaces and forms a seal against these see fig. A-D.

O-rings for movable seals, e.g. piston seals, must, in order to obtain good functioning properties, have a relatively large cross section in relation to the diameter. O-rings for stationary seals, e.g. flange seals, can have smaller cross sections.

**WORKING PRESSURE OF THE O-RING**

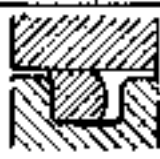
The working pressure for which O-rings can be used is dependent upon the building in case and the dimensions and the tolerances of the housing. Approximate values for max. working pressure have been given for the building in cases in the standard tables for movable and stationary seals respectively. If the O-rings are exposed to a higher pressure than the maximum working pressure recommended there is a risk that the rubber will flow in to the play between the metallic surfaces. see fig. C. for enduring high pressures it can therefore be necessary to carry out one of the following measures.

- 1) Reduce the play between the metallic surfaces. This measure is recommended when the manufacturing method and economic factors permit.
- 2) Use a O-ring of a harder quality in such a case care should be taken so that the sealing ability at low pressure is not reduced. The harder quality often has greater remaining deformation.
- 3) Use support rings, for instance of leather or plastic, which prevent the O-ring from penetrating out in the play, see fig. D

**THE POSITION OF THE O-RING AT VARIOUS PRESSURES**



**A**  
No working pressure



**B**  
Normal working pressure



**C**  
Pressure which exceeds max. working pressure but which can be permitted temporarily



**D**  
High pressure at which support rings are used.

Stationary seals can, as a rule, seal at considerably higher pressures than movable seals. Both O-rings in movable seals and O-rings in stationary seals, where the pressure varies or is pulsating, are exposed to wear. In order to reduce wear on the rings these should be greased and the surface smoothness of the metallic parts should be as fine as possible. with very low nonpulsating oil pressures somewhat coarser surfaces than those exemplified can be used for flange and lid seals. If there is nothing to prevent it ordinary lubricating oil can be used.

DEGI No. 0222-R CAT. No. 3 TITLE ADDED ON SEPT. No. 8.9.10.11

KAWUB MI WIL, DANORLUKE. ULIII NO. 1614-W, UZZZ-R.

CHECKED BY: *[Signature]*  
 DATE: 30-10-73

Fastställa	KKM/KKP	utgåva	1	2	3	4	5	6	7	8	9	10
	sd.	MNH/NP	8/49	7/57								

AKTIEBOLAGET  
BOFORS

Standard

Maskinlement

O - RINGS

General Instructions

Tablet

N9-8

Ref

16 18 4

Blad nr

2

parts, fig. blad nr

3

In

7814-W  
9-2-61

DRG. SEALED PROV.

64  
162

O-rings at rotating shafts

O-ring seals at rotating shafts can be used, but this must be decided from case to case as no general instructions can be given.

Placing of the grooves

When placing the O-ring grooves, considerations should be taken both to machining and to assembling. Thus for instance, it is simple in the case of small dimensions to obtain a groove in a shaft but difficult to fit the ring. In a cylinder the opposite applies.

Shaping of the grooves

The designer can choose between trapeze-shaped and rectangular-shaped grooves, dependent upon the methods of machining and the degree of difficulty of the actual machining.

In Bofors standard for O-rings, N9-8, both groove shapes are included. All dimensional information and surface-smoothness signs included in the standard sheets are to be included on the drawing.

Surface smoothness of the groove

As the machining costs increase with the surface smoothness the degree of machining to be carried out is a question of appraisal. Less surface smoothness can be permitted if the grip of the ring is increased instead. At the same time, however the friction is increased which is specially noticeable at low pressures. In order to be able to estimate the degree of surface smoothness and grip the number of strokes or pressure variations participated in by the seal per unit of time should be known.

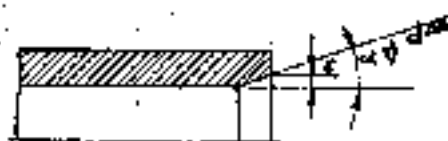
For Bofors VVP is generally recommended for stationary seals and VVW for movable seals.

Fitting of O-rings

As the diameter of the cross section of O-rings is larger than the depth of the groove great care must be taken when fitting the rings so that these are not damaged, for instance against edges, holes, threads etc.

In view of the above bevels should be executed according to the following figure and table.

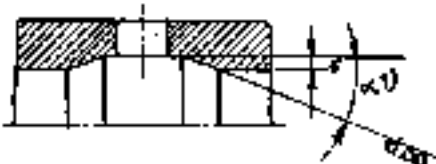
Internal bevel



External bevel



Hole through cylinder wall



O-ring cross section t	f min
1-6	0.5
2-4	0.6
3	0.7
5-7	0.9
8-4	1.1

1)  $\alpha = \max. 30^\circ$   
15-20° is most suitable

Feststäm KKM/KKD  
Su

Utgava	1	2	3	4	5	6	7	8	9	10
Man/år	6/49	7/57								

TRCD. AT CIL B'LORE -6  
 TRCD. BY Nigoren/Bakke  
 CHKD. BY i. A. Havn 6/11/73  
 DATE 7-11-73  
 UICII No. 7814-W 0222-R

Aktiebolaget  
**BOFORS**  
Standard

Maskinelement



O-rings  
General Instructions

Tabell  
**N9-8**

Reg.  
16 18 4

Blad nr. 3 Forts på blad nr. 4

7814-W  
9-2-61 DRG. SEALED PROV. 108

General building-in dimensions for movable seals

If a small frictional power is desired the grip of the O-ring on the movement side should be small. If a slight variation of the sealing friction in different editions of the same type of apparatus is desired the tolerance limits for both the O-ring and the surrounding parts should be small. Lower tolerances than those given in the following examples can be required in such cases.

The values stipulated in the tables are recommended for a working pressure of max. 100 kg/cm<sup>2</sup>.

O-ring cross section t	Play between movable metallic parts		Grip on movement side		Grip on groove side	
	half play		half grip		half grip	
	Whole play		Whole grip		Whole grip	
	Min.	Max.	Min.	Max.	Min.	Max.
1-6	0-01	0-1	0-3	0-9	-0-3	0-9
2-4	0-01	0-13	0-4	1	-0-5	1
3	0-02	0-15	0-5	1-2	-0-5	1-1
5-7	0-03	0-18	0-6	1-6	-0-6	1-5
8-4	0-04	0-21	1-1	2-2	-0-6	2

General building-in dimensions for stationary seals:

The information given under "General building-in dimensions for movable seals" can be used as approximate values even for stationary seals in those cases where the O-ring is exposed to radial compression. The minimum play between the metallic parts can, however, in this case be zero, for instance when guiding is required. The max. values in the tables can be slightly exceeded.

For seals with outer excess pressure only "closed" ring grooves can be used.

For seals with inner excess pressure both "closed" and "open" ring grooves can be used.

Designs with two or more O-rings against the same sealing lid should be avoided.

Fastställt KKH/KKD	Orgona	1	2	3	4	5	6	7	8	9	10
	Man/år	8/49	7/57								

DICI No. 7814-W, 0222-R,

TRACED AT CIL, BANGALORE-6

CHECKED BY: S. Srinivasan

DATE: 6-11-1973

20-0-73

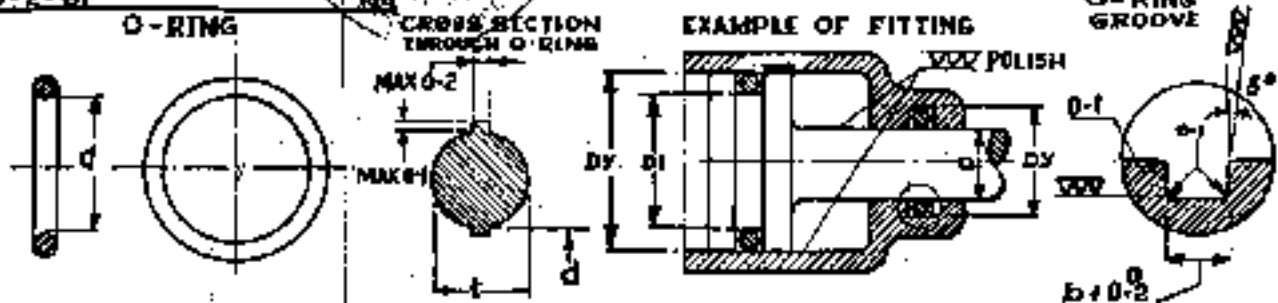


Aktiebolaget  
**BOFORS**  
Standard  
Maskinelement

**O-RINGS**  
FOR MOVABLE SEALINGS  
t = 1.3, 1.4 AND 2.4

Table  
**N9-8**  
Rev  
16. 12. 4  
Blad nr. 4  
Folios ta bladen 5

784-W  
9-2-61  
DR6 SEALED PROV.



THE SURFACE OF THE RING SHOULD BE BRIGHT, EYEN AND FREE FROM SCRATCHES AND OTHER DEFECTS. THERE SHOULD BE SO FEW BURRS AS POSSIBLE. THE ABOVE GIVEN VALUES ARE HOWEVER, PERMITTED. THE VARIATION IN HEIGHT OF THE BURRS ROUND THE RING SHOULD BE AS LITTLE AS POSSIBLE. WHEN THE BURRS ARE REMOVED, THE "CASTING SKIN" OF THE RING SHOULD NOT BE DAMAGED.

RECTANGULAR GROOVES MAY ALSO BE USED.

TOLERANCES						
NOM. DIAM.		DY			DI	
ABOVE	UP TO	PISTON	CYL	CYL GROOVE	PISTON	CYL PISTON GROOVE
	120	F8	H9	H11	F8	H9 H11
120		F7	H8		F7	H8 H11

SIZE DESIGNATION	BUILDING-IN DIMENSIONS				DIMENSION OF RING				SMS DESIGNATION D-RING.....MAT SMS 15B6
	D1	DY	O B±0.2	T	d		c		
					NOM	TOL	NOM	TOL	
2 x 4	2	4			1.6				.....
2.5 x 4.5	2.5	4.5	1.7	0.5	2.1	±0.1	1.3	±0.1	.....
3 x 5	3	5			2.6				.....
3.5 x 6	3.5	6	2.2	0.5	3.1	±0.2	1.6	±0.1	3.1 x 1.6
4 x 8	4	8			3.3				3.3 x 2.4
5 x 9	5	9			4.3				4.3 x 2.4
6 x 10	6	10			5.3				5.3 x 2.4
7 x 11	7	11			6.3				6.3 x 2.4
8 x 12	8	12			7.3				7.3 x 2.4
9 x 13	9	13			8.3				8.3 x 2.4
10 x 14	10	14	3.2		9.3	±0.2	2.4	±0.1	9.3 x 2.4
11 x 15	11	15			10.3				10.3 x 2.4
12 x 16	12	16			11.3				11.3 x 2.4
13 x 17	13	17			12.3				12.3 x 2.4
14 x 18	14	18			13.3				13.3 x 2.4
15 x 19	15	19			14.3				14.3 x 2.4
16 x 20	16	20			15.3				15.3 x 2.4
17 x 21	17	21			16.3				16.3 x 2.4
18 x 22	18	22			17.3				17.3 x 2.4

DESIGNATION: N9-8 - SIZE DESIGNATION  
EXAMPLE: N9-8-14 x 18  
NOTE: SEE W3-2

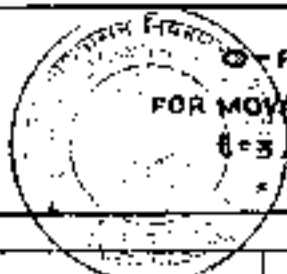
1) TOLERANCES ACCORDING TO THE ABOVE TABLE  
STOCK SIZES

MATERIAL: BG 30-6 12340-W NOTE SEE W3-2  
3.1.68. ADDED 573

REV. DI 1  
 CHKD BY: A. Alvala  
 DATE: 9.11.73

KKH/MKD  
SA. LITAVE 1 2 3 4 5 6 7 8 9 10  
M8227 8/49 7/57

**Aktiebolaget**  
**BOFORS**  
 Standard  
 Maskinfemmet



**O-RINGS**  
**FOR MOVABLE SEALS**  
**3 AND 5.7**

Tabell  
**N9-8**  
 Reg  
**16 164**  
 blad nr 5 FÖRES på blad nr 6

SIZE DESIGNATION	BUILDING-IN DIMENSIONS				DIMENSION OF RING				SMS DESIGNATION O-RING... MAT SMS1686
	D <sub>i</sub>	D <sub>y</sub>	b <sub>1</sub> ±0.2	r	d		t		
					nom.	tol.	nom.	tol.	
20 x 25	20	25			19.2				19.2 x 3
22 x 27	22	27			21.2				-----
23 x 28	23	28			21.2				22.2 x 3
25 x 30	25	30			24.2				24.2 x 3
27 x 32	27	32			26.2				26.2 x 3
30 x 35	30	35			29.2				29.2 x 3
33 x 38	33	38	4	1	32.2	±0.3	3	±0.1	32.2 x 3
35 x 40	35	40			34.2				34.2 x 3
37 x 42	37	42			36.2				36.2 x 3
40 x 45	40	45			39.2				39.2 x 3
43 x 48	43	48			42.2				42.2 x 3
45 x 50	45	50			44.2				44.2 x 3
45 x 55	45	55			44.2				44.2 x 5.7
50 x 60	50	60			49.2				49.2 x 5.7
55 x 65	55	65			54.2				54.2 x 5.7
60 x 70	60	70			59.2				59.2 x 5.7
65 x 75	65	75			64.2				64.2 x 5.7
70 x 80	70	80			69.2				69.2 x 5.7
75 x 85	75	85			74.2				74.2 x 5.7
80 x 90	80	90			79.2				79.2 x 5.7
85 x 95	85	95			84.1				84.1 x 5.7
90 x 100	90	100	7.5	1	89.1	±0.4	5.7	±0.1	89.1 x 5.7
95 x 105	95	105			94.1				94.1 x 5.7
100 x 110	100	110			99.1				99.1 x 5.7
105 x 115	105	115			104.1				104.1 x 5.7
110 x 120	110	120			109.1				109.1 x 5.7
115 x 125	115	125			114.3				114.3 x 5.7
120 x 130	120	130			119.3				119.3 x 5.7
125 x 135	125	135			124.3				124.3 x 5.7
130 x 140	130	140			129.3				129.3 x 5.7
135 x 145	135	145			134.3				134.3 x 5.7
140 x 150	140	150			139.3				139.3 x 5.7
145 x 155	145	155			144.3				144.3 x 5.7

DESIGNATION: N9-8 - SIZE DESIGNATION  
 EXAMPLE: N9-8-95x105

1) TOLERANCES ACCORDING TO THE TABLE  
 ON PAGE 4

STOCK SIZES

MATERIAL: BG 30-2

12678 W NOTE\* SEE W3-2"  
 6.10.69. ADDED. 550  
 781A-W DRG. SEALED PROV. 103  
 9-2-61

NOTE:- SEE W3-2.

Fastställt KKH/KKD  
 SA

Ulgöve 1 2 3 4 5 6 7 8 9 10  
 Mått 6/49 7/57

This drawing is the property of Aktiebolaget Bofors and is not to be used without the written consent of the company.  
 CHECKED BY: E. Nordström  
 DATE: 9-11-73 14-11-73

AKTIEBOLAGET  
**BOFORS**  
 STANDARD  
 MASKINELEMENT



O-RINGS  
 FOR MOVABLE SEALS.

$t = b \cdot 4$

In

TABELL  
**N9-8**

REG. 16 18 4

BLADNR 6 FORTFA. BLADNR 7

7814-W DRG. SEALED PROV. 103  
 8-2-61

SIZE DESIGNATION	BUILDING-IN DIMENSIONS				DIMENSION OF RING				SMS DESIGNATION O-RING... MAT. SMS 1586
	D <sub>1</sub>	D <sub>2</sub>	b <sup>0</sup> b <sup>+0.2</sup>	r	d		t		
					NOM.	TOL.	NOM.	TOL.	
145 x 160	145	160			144.1				144.1 x 8.4
150 x 165	150	165			149.1				149.1 x 8.4
155 x 170	155	170			154.1				154.1 x 8.4
160 x 175	160	175			159.1	± 0.6			159.1 x 8.4
165 x 180	165	180			164.1				
170 x 185	170	185			169.1				169.1 x 8.4
175 x 190	175	190			174.1				174.1 x 8.4
180 x 195	180	195	11	1	179.1		8.4	± 0.15	179.1 x 8.4
185 x 200	185	200			184.1				184.1 x 8.4
190 x 205	190	205			189.1				189.1 x 8.4
195 x 210	195	210			194.1				194.1 x 8.4
200 x 215	200	215			199.1				199.1 x 8.4
210 x 225	210	225			209.1	± 0.8			209.1 x 8.4
220 x 235	220	235			219.1				
230 x 245	230	245			229.1				229.1 x 8.4
240 x 255	240	255			239.1				239.1 x 8.4
250 x 265	250	265			249.1				249.1 x 8.4

DESIGNATION: N9-8 - SIZE DESIGNATION  
 EXAMPLE: N9-8-240x255

TOLERANCES ACCORDING TO THE TABLE ON PAGE 4  
 STOCK SIZES:

MATERIAL: B6 30-6

THIS DRG. IS THE PROPERTY OF THE BOKFORS AB  
 AND IS LOANED TO YOU BY THE BOKFORS AB  
 IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS  
 WITHOUT THE WRITTEN PERMISSION OF THE BOKFORS AB

1969-01-01  
 1969-01-01

DC(D) No. 7814-W, 0222-R.

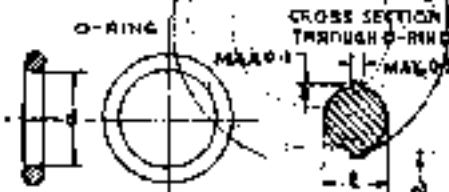
TRACED AT CIL BLORE - 6  
 TRACED BY *[Signature]*  
 CHECKED BY: *[Signature]*  
 DATE: 7-11-73

PAST: STALLO KKH/KKD UTGAVA 1 2 3 4 5 6 7 8 9 10  
 sdt MANAR: 8/49 7/87

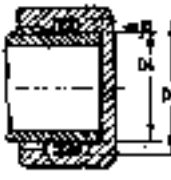
ARTIFICIALLY  
BOFORS  
STANDARD  
MACHINELEMENT

O-RINGS  
FOR STATIONARY SEALS  
2 1/2 INCHES

TABLE  
N9-8  
REV. 16 18 4  
SECTION 7 SECTION 8

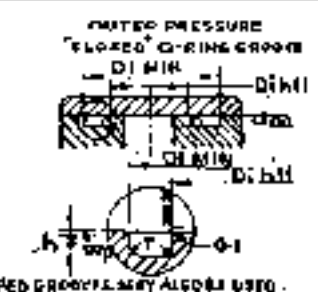
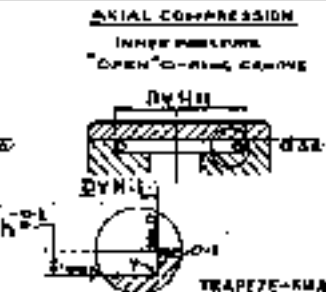
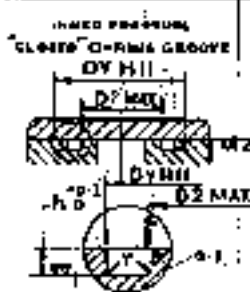


THE SURFACE OF THE RING SHALL BE BRIGHT SMOOTH AND FREE FROM SCRATCHES AND OTHER DEFECTS. THERE SHOULD BE NO FEEL BURRS OR PROTRUSIONS. THE ADJACENT SURFACES ARE NEVERTHELESS PERMITTED. THE VARIATION IN HEIGHT OF THE BURRS AROUND THE RING SHOULD BE AS SLIGHT AS POSSIBLE WHEN THE BURRS ARE REMOVED THE CONTINUITY OF THE RING SHOULD NOT BE DAMAGED.



**RADIAL COMPRESSION**

TOLERANCES					
NOM. DIM.	D	d	h	G	
ABOVE UP TO	CYL.	END PREY	CYL.	LID	GROOVE
100	±0.08	±0.08	±0.08	±0.08	±0.08



SIZE DESIGNATION	BUILDING-IN DIMENSIONS						DIMENSION OF RING				SME DESIGNATION O-RING... MAX SME154C	
	OUTER PRESSURE		INNER PRESSURE		h	b	d		b			
	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>			NOM.	TOL.	NOM.	TOL.		
2 X 4	2	5.6	4	5	0.0	1.7	0.5	1.6	1.0	1.5	1.0	---
2.5 X 4.5	2.5	6	4.5	5	0.0	1.7	0.5	2.1	1.0	1.5	1.0	---
3 X 5	3	6.5	5	5	0.0	1.7	0.5	2.6	1.0	1.5	1.0	---
3.5 X 6	3.5	7.5	5	5	0.0	1.7	0.5	3.1	1.0	1.5	1.0	3.1 X 4.5
4 X 6.5	4	8	4.5	5	0.0	1.7	0.5	3.6	1.0	1.5	1.0	---
5 X 7.5	5	9	7.5	5.5	0.0	1.7	0.5	4.8	1.0	1.5	1.0	---
6 X 8.5	6	10	8.5	4.5	1.2	2.2	0.5	5.6	10.2	1.6	2.0	---
7 X 9.5	7	11	9.5	5.5	0.0	1.7	0.5	6.4	1.0	1.5	1.0	---
8 X 10.5	8	12	10.5	6.5	0.0	1.7	0.5	7.6	1.0	1.5	1.0	---

**RADIAL AND AXIAL COMPRESSION**

SIZE DESIGNATION	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	h	b	d	b
2 X 4	2	5.6	4	5	0.0	1.7	0.5	1.6
2.5 X 4.5	2.5	6	4.5	5	0.0	1.7	0.5	2.1
3 X 5	3	6.5	5	5	0.0	1.7	0.5	2.6
3.5 X 6	3.5	7.5	5	5	0.0	1.7	0.5	3.1
4 X 6.5	4	8	4.5	5	0.0	1.7	0.5	3.6
5 X 7.5	5	9	7.5	5.5	0.0	1.7	0.5	4.8
6 X 8.5	6	10	8.5	4.5	1.2	2.2	0.5	5.6
7 X 9.5	7	11	9.5	5.5	0.0	1.7	0.5	6.4
8 X 10.5	8	12	10.5	6.5	0.0	1.7	0.5	7.6

EXAMPLE: 4.5-8-3.45  
MATERIAL: 6060  
TOLERANCES FOR D<sub>1</sub> AT RADIAL COMPRESSION ACCORDING TO THE GROOVE TOLERANCE TABLE  
SOLUTION: 1 2 3 4 5 6 7 8 9 10  
DATE: 6/49 7/57

TRACKING: 15000-6  
 TRACED BY: 100-104  
 CHECKED BY: 100-104  
 DATE: 10/26/75

ARTIE SOLAGE  
BOFORS  
STANDARD  
MASHINELEMENT

O-RINGS  
FOR STATIONARY SEALS  
C 1-6 AND 2-4

TABELL N9-8  
RIF 16 18 4  
SLEAD FOR PORTERGAAR 8 9

SIZE DESIGNATION	BUILDING DIMENSION						DIMENSION OF RING				SMS DESIGNATION O-RING... MAT. SMS 1586
	OUTER PRESSURE		INNER PRESSURE		h	b	d		t		
	DI MM	DI MM	DI MM	DI MAX.			NO. 1	TOL.	NO. 2	TOL.	

RADIAL AND AXIAL COMPRESSION

8 X 12-5	9	13	11.5	7.5				8-6				
10 X 12-5	10	14	12.5	8.5				9-6				
12 X 14-5	12	16	14.5	10.5				11.5	±0.2			
15 X 15-5	15	17	15.5	11.5				12.5				
15 X 17-5	15	19	17.5	13.5				14.5				
16 X 18-5	16	20	18.5	14.5				15.5				
18 X 21-5	18	23	21.5	17.5				18.4				
21 X 23-5	21	25	23.5	19.5				20.4				
22 X 24-5	22	26	24.5	20.5				21.4				
24 X 26-5	24	28	26.5	22.5	±2	±2	0.5	23.4	±0.3	±6	±0.1	
26 X 28-5	26	30	28.5	24.5				25.4				
28 X 30-5	28	32	30.5	26.5				27.4				
30 X 32-5	30	34	32.5	28.5				29.4				
32 X 34-5	32	36	34.5	30.5				31.4				
36 X 37-5	36	39	37.5	33.5				34.4				
37 X 38-5	37	41	39.5	35.5				36.4				
38 X 41-5	38	43	41.5	37.5				38.4				
40 X 42-5	40	44	42.5	39.5				39.4				
42 X 44-5	42	46	44.5	40.5				41.4				
47 X 49-5	47	51	49.5	45.5				46.4				
4 X 8	4	10.5	8	-				3.3				3.3 X 2.4
5 X 8	5	11.5	9	-				4.3				4.3 X 2.4
6 X 10	6	13.5	10	3.5				5.3				5.3 X 2.4
7 X 11	7	15.5	11	4.5				6.3				6.3 X 2.4
8 X 12	8	17.5	12	5.5				7.3				7.3 X 2.4
9 X 13	9	19.5	13	6.5				8.3				8.3 X 2.4
10 X 14	10	21.5	14	7.5				9.3				9.3 X 2.4
11 X 15	11	23.5	15	8.5	1.0	±2	0.5	10.5	±0.2	±4	±0.1	10.5 X 2.4
12 X 16	12	25.5	16	9.5				11.5				11.5 X 2.4
13 X 17	13	27.5	17	10.5				12.5				12.5 X 2.4
14 X 18	14	29.5	18	11.5				13.5				13.5 X 2.4
15 X 19	15	31.5	19	12.5				14.5				14.5 X 2.4
16 X 20	16	33.5	20	13.5				15.5				15.5 X 2.4
17 X 21	17	35.5	21	14.5				16.5				16.5 X 2.4
18 X 22	18	37.5	22	15.5				17.5				17.5 X 2.4

DESIGNATION  
RINA, MALING, TECHNICAL  
SPECIAL ORDER 715.000 4.2 18.00  
SPECIAL ORDER 815.000  
SPECIAL ORDER 915.000  
SPECIAL ORDER 1015.000  
SPECIAL ORDER 1115.000  
SPECIAL ORDER 1215.000  
SPECIAL ORDER 1315.000  
SPECIAL ORDER 1415.000  
SPECIAL ORDER 1515.000  
SPECIAL ORDER 1615.000  
SPECIAL ORDER 1715.000  
SPECIAL ORDER 1815.000

CAT. NO.  
97/5311-15003  
98/5311-15004

DESIGNATION  
RINA, MALING, TECHNICAL  
SPECIAL ORDER 715.000 4.2 18.00  
SPECIAL ORDER 815.000  
SPECIAL ORDER 915.000  
SPECIAL ORDER 1015.000  
SPECIAL ORDER 1115.000  
SPECIAL ORDER 1215.000  
SPECIAL ORDER 1315.000  
SPECIAL ORDER 1415.000  
SPECIAL ORDER 1515.000  
SPECIAL ORDER 1615.000  
SPECIAL ORDER 1715.000  
SPECIAL ORDER 1815.000

DESIGNATION  
RINA, MALING, TECHNICAL  
SPECIAL ORDER 715.000 4.2 18.00  
SPECIAL ORDER 815.000  
SPECIAL ORDER 915.000  
SPECIAL ORDER 1015.000  
SPECIAL ORDER 1115.000  
SPECIAL ORDER 1215.000  
SPECIAL ORDER 1315.000  
SPECIAL ORDER 1415.000  
SPECIAL ORDER 1515.000  
SPECIAL ORDER 1615.000  
SPECIAL ORDER 1715.000  
SPECIAL ORDER 1815.000

DESIGNATION: N9-8-SIZE DESIGNATION  
EXAMPLE: N9-8-20 X 24-5  
TOLERANCES FOR DI AT RADIAL  
COMPRESSION ACCORDING TO THE  
TOLERANCE TABLE ON PAGE 7

STOCK SIZES

MATERIAL: 80 30-5  
NOTE: SEE W3-2  
12878-W NOTE 12/15/52 7814-W  
F.10.60. ADD. 118 9-2-51 DRG. SEALED PROV. 106

INSTALLED RKR/KKD UTGANA 1 2 3 4 5 6 7 8 9 10  
Sd/- MAN AR 8/25/57

Aktiebolaget  
**BOFORS**  
Standard  
Maskinelement

**O-rings**  
for stationary seals  
t = 3

Tabell  
**N9-8**  
Reg. 16 18 4  
Blad nr. 9 Forts. fr. blad nr. 10



**ln**

DESIGNATION  
RING, SEALING, TOROIDAL : synthetic rubber 61.5 mm id & 3 mm circular cross section

CAT. No.  
# M2/5330-015004

DESIGNATION  
RING, SEALING, TOROIDAL : synthetic rubber 69.5 mm id & 3 mm circular cross section

CAT. No.  
# M2/5330-015005

DIR No.: 0222-R  
CAT. No. AND TITLE ADDED  
5-3-98

TRACED AT CIL, BANGALORE-6.  
TRACED BY: *Ganesh/Sw*  
CHECKED BY: *Prasanna/SS*  
DATE: 26.10.1975

size Designation	Building-in dimensions						Dimension of ring				SMS Designation O-ring ..... Mat. SMS 1586.
	Outer pressure		Inner pressure		h	b	d		t		
	D1 h ft	D1 min	D2 h ft	D2 max.			nom.	tol.	nom.	tol.	

Radial and axial compression												
20 x 25	20	28	25	17				19.2			19.2 x 3	
22 x 27	22	30	27	19				21.2			---	
23 x 28	23	34	28	20				22.2			22.2 x 3	
25 x 30	25	33	30	22				24.2			24.2 x 3	
27 x 32	27	35	32	24				26.2			26.2 x 3	
30 x 35	30	38	35	27				29.2	± 0.3		29.2 x 3	
33 x 38	33	41	38	30				32.2			32.2 x 3	
35 x 40	35	43	40	32				34.2			34.2 x 3	
37 x 42	37	45	42	34				36.2			36.2 x 3	
40 x 45	40	48	45	37				39.2			39.2 x 3	
43 x 48	43	51	48	40				42.2			42.2 x 3	
45 x 50	45	53	50	42				44.2			44.2 x 3	
47 x 52	47	55	52	44				46.5			---	
50 x 55	50	58	55	47				49.5			49.5 x 3	
52 x 57	52	60	57	49				51.5			---	
55 x 60	55	63	60	52				54.5			54.5 x 3	
58 x 63	58	66	63	55				57.5			---	
60 x 65	60	68	65	57				59.5			59.5 x 3	
62 x 67	62	70	67	59				61.5			---	
65 x 70	65	73	70	62	± 0.3	4	1	64.5	± 0.4	3	± 0.1	64.5 x 3
68 x 73	68	76	73	65				67.5			---	
70 x 75	70	78	75	67				69.5			69.5 x 3	
72 x 77	72	80	77	69				71.5			---	
75 x 80	75	83	80	72				74.5			74.5 x 3	
78 x 83	78	86	83	75				77.5			---	
80 x 85	80	88	85	77				79.5			79.5 x 3	
85 x 90	85	93	90	82				84.5			84.5 x 3	
90 x 95	90	98	95	87				89.5			89.5 x 3	
95 x 100	95	103	100	92				94.5			94.5 x 3	
100 x 105	100	108	105	97				99.5			99.5 x 3	
105 x 110	105	112	110	102				104.5			104.5 x 3	
110 x 115	110	118	115	107				109.5			109.5 x 3	
115 x 120	115	123	120	112				114.5			114.5 x 3	
120 x 125	120	128	125	117				119.5			119.5 x 3	
125 x 130	125	133	130	122				124.5			124.5 x 3	
130 x 135	130	138	135	127				129.5			129.5 x 3	
135 x 140	135	143	140	132				134.5			134.5 x 3	
140 x 145	140	148	145	137				139.5			139.5 x 3	
145 x 150	145	153	150	142				144.5			144.5 x 3	

Designation: N9-8 size designation  
Example: N9-8-70x75  
Material: 66 30-6  
Note: see W.3-2.  
12578-N NOTE "SEE W.3-2" S.10.53 ADDED 680  
7814-W DRG SEALED PROV. 9-2-61 108

Tolerances for DI at radial compression according to the tolerance table on page 7

Stock sizes:

Fastfold. KKM/KKA	Ugova	1	2	3	4	5	6	7	8	9	10
		B/49	7/57								

AKTIEBOLAGET  
BOFORS  
STANDARD  
MASKINELEMENT



O-RINGS  
FOR STATIONARY SEALS  
L-2-7

TABELL N9-8

REG 18 18 A

SH. AD BY 10  
P. 11

SIZE DIMENSION	BUILDING-IN DIMENSIONS				DIMENSION OF RING				SMS DEGENERATION O-RING... MAT SMS 1586
	OUTER PRESSURE		INNER PRESSURE		d		t		
	D1 MIN.	D2 MAX.	D3 MIN.	D4 MAX.	NOM.	TOL.	NOM.	TOL.	

RADIAL AND AXIAL COMPRESSION

SIZE	D1	D2	D3	D4	d	t	SMS
25 x 55	45	60	50	40	44.2		44.2 x 5.7
30 x 60	50	65	55	45	49.2		49.2 x 5.7
35 x 65	55	70	60	50	54.2		54.2 x 5.7
40 x 70	60	75	65	55	59.2		59.2 x 5.7
45 x 75	65	80	70	60	64.2		64.2 x 5.7
50 x 80	70	85	75	65	69.2		69.2 x 5.7
55 x 85	75	90	80	70	74.2		74.2 x 5.7
60 x 90	80	95	85	75	79.2		79.2 x 5.7
65 x 95	85	100	90	80	84.2		84.2 x 5.7
70 x 100	90	105	95	85	89.2		89.2 x 5.7
75 x 105	95	110	100	90	94.2	±0.4	94.2 x 5.7
80 x 110	100	115	105	95	99.2		99.2 x 5.7
85 x 115	105	120	110	100	104.2		104.2 x 5.7
90 x 120	110	125	115	105	109.2		109.2 x 5.7
95 x 125	115	130	120	110	114.2		114.2 x 5.7
100 x 130	120	135	125	115	119.2	±0.1	119.2 x 5.7
105 x 135	125	140	130	120	124.2		124.2 x 5.7
110 x 140	130	145	135	125	129.2		129.2 x 5.7
115 x 145	135	150	140	130	134.2		134.2 x 5.7
120 x 150	140	155	145	135	139.2		139.2 x 5.7
125 x 155	145	160	150	140	144.2		144.2 x 5.7
130 x 160	150	165	155	145	149.2		149.2 x 5.7
135 x 165	155	170	160	150	154.2		154.2 x 5.7
140 x 170	160	175	165	155	159.2		159.2 x 5.7
145 x 175	165	180	170	160	164.2	±0.6	164.2 x 5.7
150 x 180	170	185	175	165	169.2		169.2 x 5.7
155 x 185	175	190	180	170	174.2	±0.2	174.2 x 5.7
160 x 190	180	195	185	175	179.2		179.2 x 5.7
165 x 195	185	200	190	180	184.2		184.2 x 5.7

RADIAL COMPRESSION

SIZE	D1	D2	D3	D4	d	t	SMS
190 x 200	190	200			189.3		189.3 x 5.7
195 x 205	195	205			194.3		194.3 x 5.7
200 x 210	200	210			199.3	±0.2	199.3 x 5.7
205 x 215	205	215			204.3		204.3 x 5.7
210 x 220	210	220			209.3		209.3 x 5.7
215 x 225	215	225			214.3		214.3 x 5.7
220 x 230	220	230			219.3		219.3 x 5.7

DESIGNATION: N9-B-SIZE DESIGNATION  
EXAMPLE: N9-B-120/130  
(TOLERANCES FOR D1 AT RADIAL COMPRESSION  
ACCORDING TO THE TOLERANCE TABLE ON  
PAGE 7)

MATERIAL: 16G 3P-6  
NOTE: -SEE W3.2  
STOCK SIZES:

PASSETALLR	KXH/KRD	UTDAX	1	2	3	4	5	6	7	8	9	10
		MAX. NO.	8/43	1/57								

DESIGNATION: N9-B-SIZE DESIGNATION  
 CALL NO. + POSITION-ALISA  
 DRAG SEALING, TECHNICAL: 44444444  
 DRAWING: 17/3 mm, 1/4 x 1/4 mm  
 PRIMARY: 1/4 x 1/4 mm  
 DATE: 22-11-73  
 53-41

TRACER ATTILJANGAL OJES  
 TRACER BY: *[Signature]*  
 CHECKED BY: *[Signature]*  
 DATE: 22-11-73

AKTIB6018961  
**BOFORS**  
 standard  
 MABRITTE (T) (T) (T)

**O-RINGS**  
 FOR STATIONARY SEALS  
 670-7 AND 614

GROUP  
**N9-B**  
 N9-  
 16 18 4  
 II 12

in

SIZE DESIGNATION	BUILDING DIMENSIONS			DIMENSION OF RING				SMA DESIGNATION O-RING... MAT SMA 1586
	DN	DN <sub>1</sub>	DN <sub>2</sub>	d	t	TOTAL	TOL.	
<b>RADIAL COMPRESSION</b>								
240 x 250	240	260		250-3	10-8			250-3 x 5-7
260 x 270	260	270		260-3				260-3 x 5-7
270 x 280	270	280		270-3				270-3 x 5-7
280 x 290	280	290		280-3				280-3 x 5-7
290 x 300	290	300		290-3	11			290-3 x 5-7
300 x 310	300	310		300-3				300-3 x 5-7
320 x 330	320	330	7.5	310-3		5-7	10-2	310-3 x 5-7
340 x 350	340	350		330-3				330-3 x 5-7
360 x 370	360	370		350-3				350-3 x 5-7
380 x 390	380	390		370-3	11-5			370-3 x 5-7
400 x 410	400	410		390-3				390-3 x 5-7
420 x 430	420	430		410-3				410-3 x 5-7
440 x 450	440	450		430-3				430-3 x 5-7
460 x 470	460	470		450-3	12			450-3 x 5-7
480 x 490	480	490		470-3				470-3 x 5-7
500 x 510	500	510		490-3				490-3 x 5-7
125 x 160	125	160		124-1				124-1 x 8-4
150 x 165	150	165		149-1				149-1 x 8-4
155 x 170	155	170		154-1				154-1 x 8-4
160 x 175	160	175		159-1				159-1 x 8-4
165 x 180	165	180		164-1	10-8			164-1 x 8-4
170 x 185	170	185		169-1				169-1 x 8-4
175 x 190	175	190		174-1				174-1 x 8-4
180 x 195	180	195		179-1				179-1 x 8-4
185 x 200	185	200		184-1		8-4	10-1/2	184-1 x 8-4
190 x 205	190	205	11	189-1				189-1 x 8-4
195 x 210	195	210		194-1				194-1 x 8-4
200 x 215	200	215		199-1				199-1 x 8-4
210 x 225	210	225		209-1	10-8			209-1 x 8-4
220 x 235	220	235		219-1				219-1 x 8-4
230 x 245	230	245		229-1				229-1 x 8-4
240 x 255	240	255		239-1				239-1 x 8-4
250 x 265	250	265		249-1				249-1 x 8-4

CAT. NO. 022-2  
 DATE 11-1-18  
 DESIGNATION: N9-B-170 x 185  
 MATERIAL: B6 70-6  
 STOCK SIZE:

DESIGNATION: N9-B-170 x 185

TOLERANCES FOR DI & RADIAL  
 COMPRESSION ACCORDING TO THE  
 TOLERANCE TABLE ON PAGE 7

MATERIAL: B6 70-6

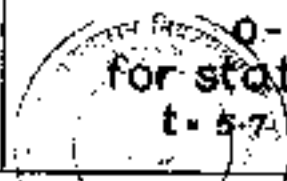
STOCK SIZE:

T814-W O-RING SEALING PROC. 105  
 7-2-61

Fasteners: KKN JKD    Utgiva: 1 1 3 4 5 6 7 8 9 10  
 M/10/18 8/19 7/67



Aktiebolaget  
BOFORS  
Standard  
Maskinelement



O-rings  
for stationary seals  
t = 5.7 and 8.4

In

Tabell  
N9-8  
Reg. 16-18-4  
Blad nr. 12

Size Designation	Building-in dimensions						Dimension of ring				SMS Designation O-ring ..... Mat. SMS 1586
	Outer pressure		Inner pressure		h	r	d		t		
	D1 h11	D1 min.	D2 H11	D2 max.			nom.	tol.	nom.	tol.	
Axial Compression											
190 x 200	190	205	199	184	4.5	t	169.5	± 0.8	8.7	± 0.2	189.3 x 5.7
195 x 205	195	210	204	189			194.5				194.5 x 5.7
200 x 210	200	215	209	194			199.5				199.5 x 5.7
210 x 220	210	225	219	204			209.5				209.5 x 5.7
220 x 230	220	235	229	214			219.5				219.5 x 5.7
230 x 240	230	245	239	224			229.5				229.5 x 5.7
240 x 250	240	255	249	234			239.5				239.5 x 5.7
250 x 260	250	265	259	244			249.5				249.5 x 5.7
260 x 270	261	276	269	254			259.5				259.5 x 5.7
270 x 280	271	286	279	264			269.5				269.5 x 5.7
280 x 290	281	296	289	274			279.5	279.5 x 5.7			
290 x 300	291	306	299	284			289.5	289.5 x 5.7			
300 x 310	301	316	309	294			299.5	299.5 x 5.7			
320 x 330	321	336	329	314			319.5	319.5 x 5.7			
340 x 350	341	356	349	334			339.5	339.5 x 5.7			
360 x 370	361	376	369	354			359.5	359.5 x 5.7			
380 x 390	381	396	389	374			379.5	379.5 x 5.7			
400 x 410	401	416	409	394			399.5	399.5 x 5.7			
420 x 430	422	437	428	413			419.5	419.5 x 5.7			
440 x 450	442	457	446	433			439.5	439.5 x 5.7			
460 x 470	462	477	468	453	459.5	459.5 x 5.7					
480 x 490	482	497	488	473	479.5	479.5 x 5.7					
500 x 510	502	517	508	493	499.5	499.5 x 5.7					
145 x 160	145	165	160	140	6.7	t	144.1	6.4	± 0.15	144.1 x 8.4	
150 x 165	150	170	165	145			149.1			149.1 x 8.4	
155 x 170	155	175	170	150			154.1			154.1 x 8.4	
160 x 175	160	180	175	155			159.1			159.1 x 8.4	
165 x 180	165	185	180	160			164.1			164.1 x 8.4	
170 x 185	170	190	185	165			169.1			169.1 x 8.4	
175 x 190	175	195	190	170			174.1			174.1 x 8.4	
180 x 195	180	200	195	175			179.1			179.1 x 8.4	
185 x 200	185	205	199	179			184.1			184.1 x 8.4	
190 x 205	190	210	204	184			189.1			189.1 x 8.4	
195 x 210	195	215	209	189			194.1			194.1 x 8.4	
200 x 215	200	220	214	194			199.1			199.1 x 8.4	
210 x 225	210	230	224	204			209.1			209.1 x 8.4	
220 x 235	220	240	234	214			219.1			219.1 x 8.4	
230 x 245	230	250	244	224			229.1			229.1 x 8.4	
240 x 255	240	260	254	234	239.1	239.1 x 8.4					
250 x 265	250	270	264	244	249.1	249.1 x 8.4					

Designation: N9-8 - size designation  
 Example: N9-8-220 x 235  
 Material: BS 50-6.  
 NOTE: SEE W3-2.  
 Stock sizes:   
 19876-W NOTE SEE W3-2  
 6-10-69 ADDED  
 7818-W DRG. SEALED PROV.  
 9-8-67  
 105  
 Faststaldt KKH/KKO Urvaga 1 2 3 4 5 6 7 8 9 10  
 S4 MÅNDR 8/49 7/87

TRACED AT C.I.L. BANGALORE-6 DCU No. 7415-W, 0222-R,  
 CHECKED BY: *[Signature]*  
 DATE: 9.11.1973.



# QUALITY ASSURANCE PLAN



Document ID	QAP-00207
Subject	CYLINDER RAISING AXLE REAR TO DRAWING NO. IAN 86 SA
Revision	A
Release Date	01-Mar-2024 17:27
Effective From	02-Mar-2024 00:00

Prepared By	Checked By	Approved By
815584	992727	992034

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**GUN CARRIAGE FACTORY**  
**A GOVT. OF INDIA ENTERPRISE**  
**MINISTRY OF DEFENCE**  
**(A UNIT OF ADVANCED WEAPONS AND EQUIPMENT INDIA LTD)**

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**A Summary of Changes section appears at the end of this specification**

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	QUALITY ASSURANCE PLAN	



# QUALITY ASSURANCE PLAN



## SCOPE

This quality assurance plan is a general guide to meet the quality requirements of product. It consists of applicable procedures (describing production processes, inspection & testing instructions), applicable workmanship standards, the measurement tolerances applicable, the description of material standards and so forth. It also mentions the list of documents, test certificates that will be submitted by firm to GCF along with finished component.

### 1. Nomenclature & Drawing No.:

[CYLINDER RAISING AXLE REAR TO DRAWING NO. IAN 86 SA.](#)

### 2. Dimension & Tolerance:

As per relevant IS/BS/BIS standard etc. mention in drawing of item/component. In case of assembly or subassembly drawings the type of fit should be follow as per relevant drawings. Angular or linear attachment or fitting at any location should be as per drawings.

### 3. Material & Heat Treatment Condition:

As per DRAWING NO. [IAN 86 SA.](#)

SL NO.	DRAWING NO. & NOMENCLATURE	MATERIAL
1.	IAN 86 SA. CYLINDER RAISING AXLE REAR	NOT APPLICABLE (ASSEMBLY DRAWING.)
2.	4020756 Rod	ALT MATL: - <a href="#">BS: 970</a> (PART-1)- 1983 GRADE 070 M55 (NORM) LRS 63
3.	4020757 Cylinder	ALT MATL: - STEEL <a href="#">BS:970</a> , Pt. 1-1983, 080 M50 (NORMALISED) HARDNESS 170-210 HB
4.	4021141 Axle raising gear, front Cylinder Welding	NOT APPLICABLE (ASSEMBLY DRAWING.)
5.	5051452 Axle raising gear front Bracket Welding and machining	NOT APPLICABLE (ASSEMBLY DRAWING.)
6.	5051455 Cover	MATERIAL IN INDIA: - <a href="#">BS:970</a> , PART 1; 1983, GRADE 150 M 36, CONDITION 'R'
7.	5051456 Cover	MATL IN INDIA: - <a href="#">BS:970</a> Pt-I-1983 Gde 080M50 "NORMALISED"
8.	5073586 Head	MATERIAL IN INDIA: - <a href="#">BS EN 12163 DESIGNATION CW 307 G CONDITION R680</a>

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	QUALITY ASSURANCE PLAN	



# QUALITY ASSURANCE PLAN



9.	6108931 Pin	<a href="#">BS 970</a> Part-1-1983 Gde 070M55 (NORM.) OR <a href="#">IS:2004-1991 Class 4, Designation 45C8</a>
10.	6108932 PLATE LOCKING PISTON JOINT PIN	ALT. MATL. <a href="#">BS: 970</a> Part 1: 1983 Gde 070M20 OR <a href="#">IS: 2062-2011 Gde E 250 A</a>
11.	6112379 Bush	ALT MATL: - <a href="#">BS:1400</a> PB1 (OR) <a href="#">CASTING EN 1982:1998-CC 483 K-GS</a> (OR) <a href="#">IS:28</a> -1985 GRADE 2, SAND CAST
12.	6112382 Clip	ALT MATL: - <a href="#">BS: 5216</a> -1975, ND3 OR DEF 106 OR <a href="#">IS:2507</a> -1975 GRADE 9 DESIGNATION 55Si7
13.	6116630 Nut	ALT MATERIAL: - STEEL, <a href="#">BS: 970</a> , PART 1, 1983-07 OM 20

### 3.1 Test/Checks and Acceptance criteria for Material.

SL. NO	TEST/CHECK	PARAMETER	ACCEPTANCE/AS PER APPLICABLE SPECIFICATION
1	Chemical composition	Composition	As per Standard/Specification mentioned in drawings
2	Mechanical properties	Tensile Strength	As per Standard/Specification mentioned in drawings
		Yield Stress	As per Standard/Specification mentioned in drawings
		% Elongation	As per Standard/Specification mentioned in drawings
		Hardness	As per Standard/Specification mentioned in drawings
		Impact strength	As per Standard/Specification mentioned in drawings
		Load Test	As per Standard/Specification mentioned in drawings
3	Environmental impact test	Corrosion test, Oil /grease résistance, Water Resistance test, etc.	As per Standard/Specification mentioned in drawings

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	QUALITY ASSURANCE PLAN	



# QUALITY ASSURANCE PLAN



3.2 Manufacturer has to supply one test piece from bulk of material used for manufacturing along with item/component etc. supplied to GCF for testing as per specification. (Factory may check chemical/mechanical and other properties whenever required)

## 4. Method of manufacture \*:

4.1 Manufacturer has to strictly follow the Scope of Design and Manufacturing if given in the drawing.

4.2 Item/component made by casting/machining/forging /welding etc. should meet the dimension, tolerances, surface finish, surface treatment etc. as specified in drawing. If there is any ambiguity in relation to drawing of items/components/specification, then he has to consult the GCF factory before mass production of item/component.

4.3 Manufacturer has to specify the method of manufacturing of items/components/assembly/subassembly like Casting/Forging/Machining/Welding etc. other operations used so that final outcome has specified chemical and mechanical properties. During and after machining, all dimensions and surface finish should be maintained as per specified drawing/standards.

**5.0 Inspection:** Following methodology is to be followed for inspection.

### 5.1 Mode of Inspection & Sample Size/Selection:

**5.1.1 At Firm Premises:** A team from GCF end will be deputed for Inspection of material/components/items at firm premises. Sample from bulk quantity will be selected by the team and will be send for inspection at NABL/GOVT laboratory for testing's as per specification. The bulk quantity before dispatch will be sealed and sign by the team and Firm representative. The manufacturer will also provide 100% pre inspection report of item /components/material along with the lot of material supplied as per input material inspection SOP.

**5.1.2 At Receipt End:** Inspection at GCF end will be done by Material inspection department as per sampling plan specified in [IS standard 2500 part-II, 1965](#). Selected sample from bulk will be tested in GCF laboratory or any other NABL/GOVT lab to ensure the quality as applicable. Firm has to provide sample of raw material used for manufacturing along with each lot supplied. As per AWEIL input material inspection SOP.

### 5.2 Visual Inspection

S.NO.	DETAILS OF FEATURE	ACCEPTANCE CRITERIA
A	All Sharp Edges & Burrs	To be rounded off/chamfered and burrs to be removed
B	Surface finish.	Rust /pit marks not allowed and coating & plating is to be applied as per standard in drg.

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	QUALITY ASSURANCE PLAN	



# QUALITY ASSURANCE PLAN



The visual condition of item supplied by vendor should be in acceptable condition and free from corrosion, rust and other environmental impact. The item /component surface or subsurface supplied should be free from pits, cracks, flaws and other defects which may affect its functionality in future.

## 5.3 Dimensional Inspection:

All dimensions (critical, major & minor in nature) & geometrical features of drawings are to be covered in check sheet and should be duly inspected by concerned quality control section. Components, having dimensions as per drawing, should only be accepted by inspectorate.

No deviation in dimension or in geometrical feature is permitted. Latest and calibrated measuring instrument with high accuracy as possible to be used for measurement.

If computerized measuring machine like coordinate measuring machine etc. are used for measurement their details along with tolerance and least count to be provided along with the report or mentioned in report.

## 6. Other Test on Semi-finished/finished Component.

6.1 Details of tests /check on Semi-finished/ finished items and acceptance criteria:

S No.	TEST / CHECK	SAMPLE SIZE	ACCEPTANCE CRITERIA
A	Hardness Test (In process Inspection)	100%	If applicable, Hardness Within Specified hardness Range as per Standard.
B	Surface Treatment /Coatings	100%	As per standard if applicable
C	Environmental /Corrosion test	As applicable	If applicable as per standard specified

6.2 It is to be ensured by vendor that item/component /material supplied having homogeneous chemical/mechanical/physical properties and having uniform surface coating/ treatment /hardness throughout the cross section as mentioned in relevant drawing/standard or specification.

6.3 Surface treatment if/as mentioned in drawing Part No. [IAN 86 SA](#) AND ITS PART DRAWINGS.

SL NO.	DRAWING NO. & NOMENCLATURE	MATERIAL
1.	4020756 Rod	SURFACE TREATMENT: - HARD CHROMIUM PLATED NOTE: - CHROMIUM PLATE SURFACE D= 25f8 AND D= 22 INCLUDING 15 DEGREE TAPER THICKNESS OF CHROMIUM PLATE = 0.05
2.	5051452	SURFACE TREATMENT TO SPEC <a href="#">Y050</a> ( <a href="#">Y050</a> REPLACED BY <a href="#">Y051</a> )

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	QUALITY ASSURANCE PLAN	



# QUALITY ASSURANCE PLAN



	Axle raising gear front Bracket Welding and machining	
3.	5051455 Cover	SURFACE TREATMENT TO SPEC <a href="#">Y050</a> ( <a href="#">Y050</a> REPLACED BY <a href="#">Y051</a> )
4.	5051456 Cover	SURFACE TREATMENT TO SPEC <a href="#">Y050</a> ( <a href="#">Y050</a> REPLACED BY <a href="#">Y051</a> )
5.	6108931 Pin	ZINC PLATED TO SPEC <a href="#">Y053</a>
6.	6108932 PLATE LOCKING PISTON JOINT PIN	SURFACE TREATMENT TO SPEC <a href="#">Y053</a>
7.	6112382 Clip	SURFACE TREATMENT TO SPEC <a href="#">Y3-11</a>

## 7. List of Documents:

(To be submitted by firm along with finished component during factory end inspection)

- (1) Pre inspection report of material/component/item as per specification and standard mentioned in drawing.
- (2) Certificate of conformity by supplier if applicable.
- (3) Vendor should submit dimensional report of material/item/component along with details of instrument and their tolerances as applicable as per Para 4.3 (sample 100%)
- (4) In material test report Heat treatment process and condition should be clearly mentioned and as per specification mentioned in drawing,
- (5) Material Chemical/Mechanical/Physical/ Microstructure/Load test report as per relevant standard and specification mentioned in drawings of supply order from authorized GOVT/NABL /DGQA Laboratory.
- (6) Vendor should ensure at least 90% reliability of item/component.
- (7) Guarantee/ Warranty certificate as per relevant supply order.

## 8. Important Note:

- (1) Hardware items of best trade Quality to be used.
- (2) Final authority of acceptance is based on the Fit for Trial (FFT) report of item/material/component.
- (3) Use rust preventative after integration, location specified as per drawings specification; if applicable.

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# QUALITY ASSURANCE PLAN



## SUMMARY OF CHANGES

SL No	Document	Rev	Change
1	<a href="#">CYLINDER RAISING AXLE REAR TO DRAWING NO. IAN 86 SA.</a>	A	Initial Release

GCF Released

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