

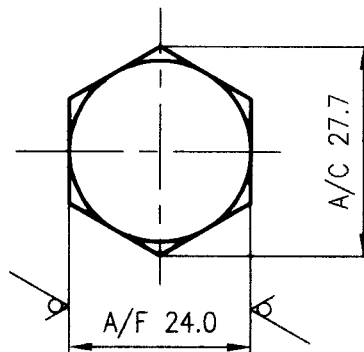
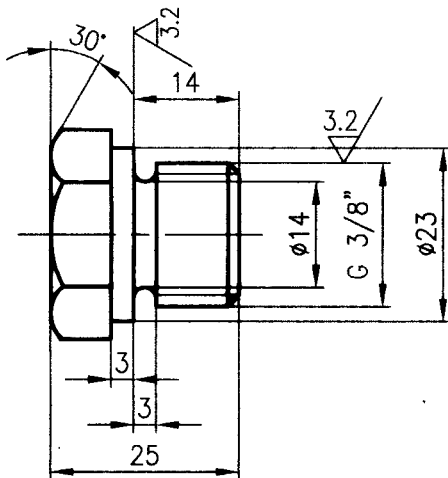
ALL DIMENSIONS ARE IN MILLIMETRES.

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP/QP

REV	DATE	ALTERED K.P.LEON
01	25.08.75	CHD & APPD

Ø24 ALTERED TO Ø23 TO AVOID INTERFERENCE WITH BONNET/YOKE CUM BONNET

12.5 / 3.2 ✓



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DRAWING RETRACED WITH REV.01 ON 29.06.2001

-	Ø32 x 30	15 026 360	IS 1875 CL.4	N & T	10	0.067	0.178	--	14	
NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No	
				BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI 620014.		DRN	NAME	SIGN	DATE	NO. OF VAR
						CHD	P. BOOMINATHAN		29.06.01	
						APPD	K.S.RAMAN		29.06.01	
DEPT VL			SCALE	WEIGHT (KG).	REFERENCE INFORMATION'S				NO. OF ITEMS	
CODE 320			1 : 1	0.067	CAD: C401142 COMP. CODE: 930064340000					
TITLE					CARD CODE	DRAWING NO.			REV	
PLUG G 3/8"					U 01	4-V-0128-01142				

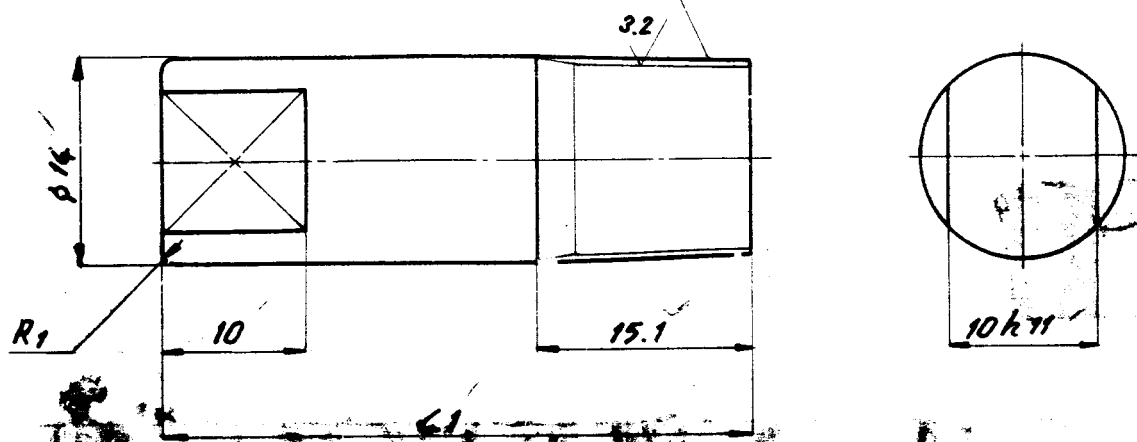
REV 01	DATE	ALTERED	REV 02	DATE	ALTERED
		CHECKED			CHECKED

2.5 ✓ / 3.2 ✓

10k11	0.000
	-0.110

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$\frac{1}{4}$ " - 18 NPT AS PER ANSI B 2.1



MICROFILMED ON  
ROLL NO 526 FRAME 155

1	$\phi 16 \times 4.6$	15039130	SA 105	NR	10	0.05	0.07	L.V. 2683-04846	034
NO. OF PIECES	DESCRIPTION	CODE NO	MATL. SPECN.	HEAT TREATMENT	SCRAP SORT	NET WT. (kg)	GROSS WT. (kg)	DRG. NO	ITEM NO.



**BHARAT HEAVY ELECTRICALS LIMITED**  
BOILER PLANT UNIT, TIRUCHIRAPALLI-620014

DEPT	CODE		SCALE 2:1	WEIGHT (kg)	REF. TO ASSY. DRG	IT. NO.
------	------	--	-----------	-------------	-------------------	---------

**PLUG [  $\frac{1}{4}$ " - NPT ]**

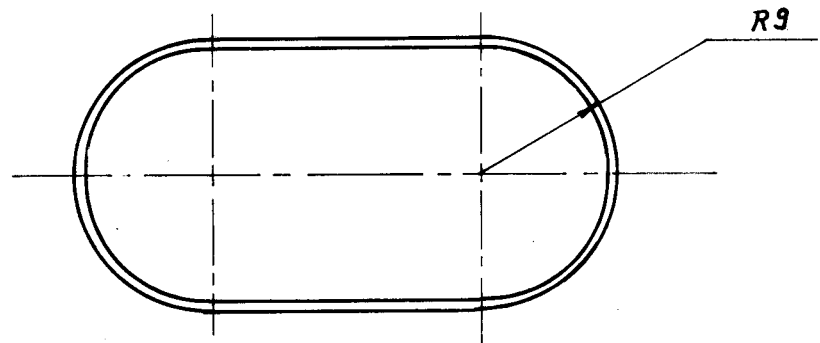
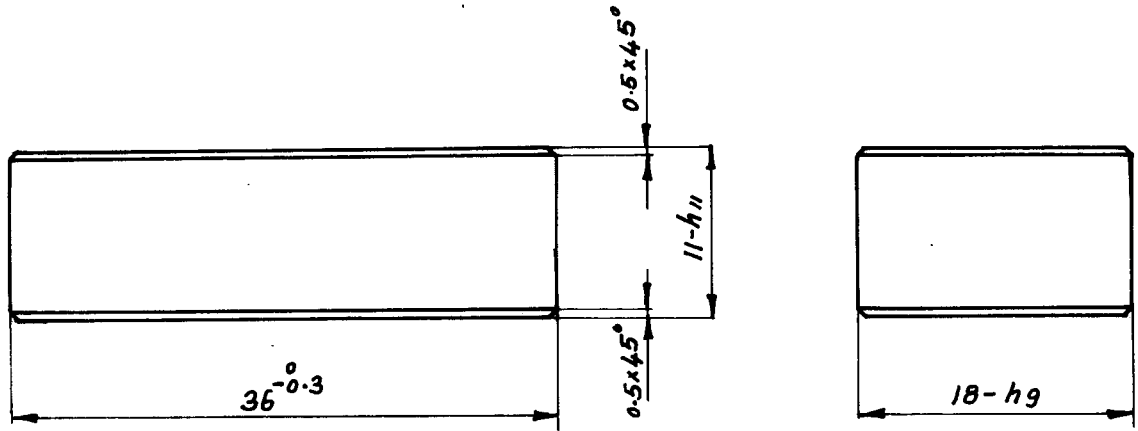
DRAWN	NAME K. S. Suresh	SIGN	DATE 15-08-78
CHECKED	K.B	SIGN	DATE 19-8-78
APPROVED		SIGN	DATE 21/8/78

DIMENSIONS TO BE CONTROLLED WITHIN LIMITS AS SHOWN. MACHINING TOLERANCE = 0.25 mm UNLESS OTHERWISE SHOWN. NON-MACHINING TOLERANCE =

DRAWING NO. 75 16 REV 17  
CARD CODE L.V. 2683.04846

6:3


11-h11	0
	-0.110
18-hg	0
	-0.052



15 2075285

01	93 100 399 0000 4 V B004 0 6357	A 193-B7	φ22 x 50	15039 094	HARDENED & TEMPERED	20	0.05	0.15
SL NO	COMPONENT CODE DRG NO.	MATL SPECN	MATL SIZE	MATL CODE	HEAT TREATMENT	SCRAP SORT	NET WT (KG)	GROSS WT (KG)

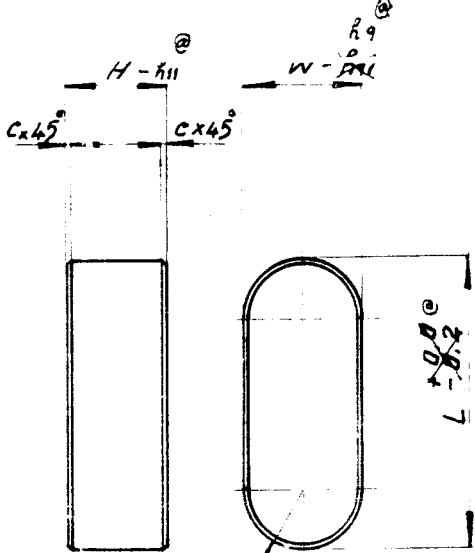
REMARKS				TOTAL NET WT (kg)			
SCALE	DRAWN	<i>Param...</i>		ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX
NTS	CHECKED						
	APPROVED	M. NAGARAJAN <i>[Signature]</i>					
	STDS. OFFICER						
	DATE						
				TRANS. COPY NO.			

 33-116	TYPE	GROUP	OLD DRG.	NEW DRG.
	TITLE <b>KEY 18x11x36</b>		DRAWING NO. <b>4-V-B004-06357</b>	

DATE	ALTERED	M. J. L. G.
13.3.78	CHECKED	<i>[Signature]</i>
ZONE	SL NO 3 INCLUDED.	
DATE	ALTERED	K.M. HAROON
27.6.78	CHECKED	R. KRISHNAMODAR
SL NOS	4 & 5 INCLUDED.	
REV	DATE	APPD.
4	13-07-85	ALTRD.
SL No. 6 INCLUDED		

DIAMETER OVER UP TO AND INCLUDING	h9	h11
6-10	+0.000	-0.000
	-0.036	-0.090

TOLERANCE ON L	
UP TO 28 mm	+0.0
	-0.2
32 mm TO 80mm	+0.0
	-0.3
90mm AND ABOVE	+0.0
	-0.5



SL No.	NEW DRG. NO.	OLD DRG. NO.	SPECN.	RAW MATERIAL SIZE	MATERIAL CODE NO. (HP)	WE (HP)	DIMENSION L	DIMENSION W	DIMENSION H	DIMENSION C	DIMENSION R	FINI SHEET WE (HP)	APPLICABLE TYPE NO.
1	4-V-2282-04226	-	ASTM A182-F6 A 479-418	16 x 30	15024252	0.01	25	8	9	0.25	4	0.01	2282
2	4-V-2286-04226	-	ASTM A182-F6 A 479-418	16 x 25	15024252	0.01	20	8	9	0.25	4	0.01	2285, 2298, 2310
3	4-V-2661-04226	-	ASTM A182-F6 BMCQ-45	16 x 3	15024252	0.016	25	10	8	0.25	5	0.016	2661, 2662
4	4-V-1128-04226	-	ASTM A182-F6 BMCQ-45	51	5024252	0.18	100	10	8	0.5	5	0.05	1128
5	4-V-2673-04226	-	ASTM A182-F6 BMCQ-45	30	7024252	0.06	30	10	9	0.5	5	0.04	2671
6	4-V-2899-04226	-	ASTM A182-F6	45	024254	0.136	45	12	8	0.5	6	0.05	2899, 2900

SL No.	ITEM No.	MATERIAL SPECN.	TREATMENT	SCRAP SORT	TYPE OF CERTIFICAT
		A 479-418 ASTM A182-F6	HAR	40	CERTIFY

**NOTE:**  
1. HEAT TREAT TO 200 TO 250 BHN

DATE	ALTRD.	D. DEVASAHAYAM
03.12.81	CHD.	V. BABU
IN SL. NO 3, 4 & 5 MATL. BMCQ-45 CHANGED TO ASTM A182-F6		

FIRST ANGLE	SCALE	DRAWN	TOTAL Wt. (kg)
		A. M. NATHAN	
		CHECKED	TYPE
		K. BRAGALU	
		APPROVED	
		<i>[Signature]</i>	
ALL DIMENSIONS IN MILLIMETRES		DATE	NEW/OLD DRG. No.
		9.3.78	

**CAUTION**

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05-230

TITLE

# PARALLEL KEY

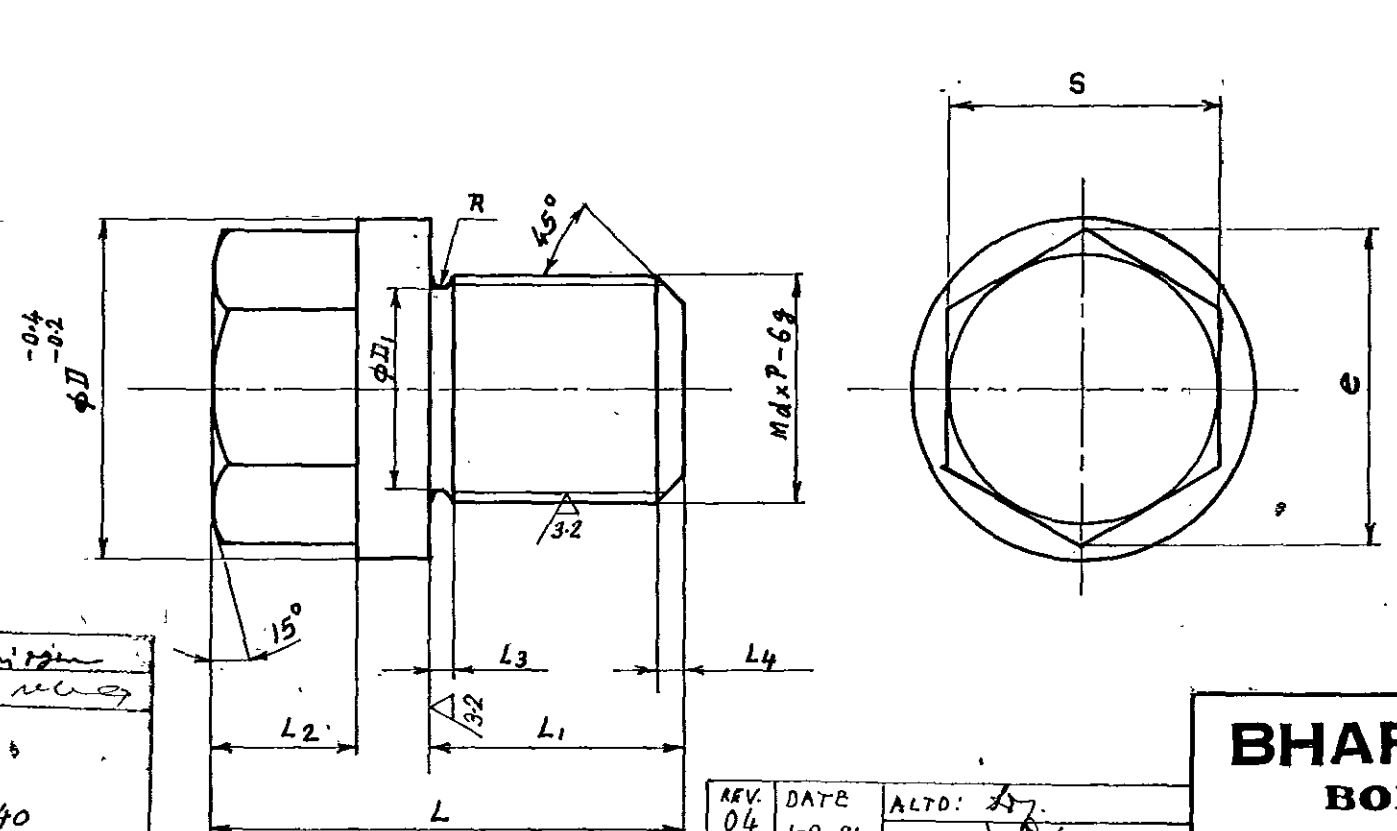
DRAWING No.

## 4-V-0000-04226

REVISION

04

SL NO	DRAWING NUMBER	RAW MATL DETAILS				WT [KG]		DIMENSIONS											COMPONENT CODE	REMARKS
		SIZE	SPECN	MATL CODE	SCRAP SORT	GROSS	NET	Md x P-6g	$\phi D_1$	e	S	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	R			
01	3V 5144 06413/02	$\phi 40 \times 60$	ASTM A193-B7, QUENCHED & TEMPERED, CERTIFY	15 039 116	20	0.59	0.27	M24x2	37	21	34.6	30	51	24	16	3	2	1.5	931006770000	-
02	3V 5150 06413/02	$\phi 50 \times 70$		15 039 197	20	1.11	0.33	M30x2	43	27	41.6	36	62	30	19	3	2	1.5	931006780000	-
03	3-V-5152-06413/02	$\phi 36 \times 50$		15 039 088	20	0.40	0.14	M20x1.5	30	16.5	28	24	40	20	13	3	2	1.5	931007480000	-
04	3-V-5186-06413/02	$\phi 32 \times 46$	ASME SA182-GR-F60, HARDENED & TEMPERED, CERTIFY	-	40	0.29	0.14	M20x1.5	30	16.5	28	24	40	20	13	3	2	1.5	931048020000	3" 300c
05	3-V-5188-06413/02	$\phi 40 \times 57$		-	40	0.56	0.27	M24x2	37	21	34.6	30	51	24	16	3	2	1.5	931048030000	4" & 6" - 300c
06	3-V-5189-06413/02	$\phi 45 \times 68$		-	40	0.85	0.33	M30x2	43	27	41.6	36	62	30	19	3	2	1.5	931048040000	8" 300c
07	3-V-1447-06413/01	$\phi 50 \times 55$	ASTM A193-B7, RT, CERTIFY	15 039 197	20	0.88	0.30	M30x1.5	43	27	41.6	36	46	14	19	3	2	1.5	931064790000	-
08	3-V-5199-06413/01	$\phi 32 \times 46$	SA182 GR F316	-	46	0.29	0.14	M20x1.5	30	16.5	28	24	40	20	13	3	2	1.5	931068440000	-
09	3-V-5196-06413/02	$\phi 40 \times 57$	SOLUTION HEAT TREATED	-	46	0.56	0.27	M24x2	37	21	34.6	30	51	24	16	3	2	1.5	931068450000	-
10	3-V-2001-06413/02	$\phi 50 \times 55$	CERTIFY	-	46	0.88	0.3	M30x2	43	27	41.6	36	62	30	19	3	2	1.5	931068460000	-



12.5 / 32

**NOTES:-**  
 1. UNSPECIFIED SHARP CORNERS TO BE CHAMFERED TO 0.5x45.  
 2. HARDNESS - 26 TO 32 HRC FOR B7 MATL.

REV	DATE	ALTD:	CHKD:
08	21.05.98	CHD & APPD: [Signature]	[Signature]

IN SL. NO. 09 & 10 DIMNS. M24x1.5 & M30x1.5 REVISED TO M24x2 & M30x2 REFER DCN. CS. 0863

REV	DATE	ALTD:	CHKD:
07	9.12.96	R. [Signature]	[Signature]

NOTES UPDATED  
 REFER DCN. CS. 0640

REV	DATE	ALTD:	CHKD:
04	1-2-94	[Signature]	[Signature]

1) NOTE UNSPECIFIED TOL. REF. CHANGED TO SQP  
 2) DCN No. CS: 0260

REV	DATE	ALTD:	CHKD:
06	17-06-96	N.D. PAL	[Signature]

SL. NO. 8 TO 10 ARE INCLUDED.  
 SL. NO. 07 INCLUDED.

REV	DATE	ALTD:	CHKD:
03	5-1-94	N. DHANAPAL	[Signature]

1. SLNO 4 TO 6 INCLUDED.

REV	DATE	ALTD:	CHKD:
05	13.2.96	R. L. [Signature]	[Signature]

IN SL. NO 3 THE THREAD PITCH 2 IS CHANGE TO 1.5  
 DCN No. GW/88/0018

REV	DATE	ALTD:	CHKD:
01	25.10.85	S. J. WESLEY	[Signature]

SL. No. 03 ADDED

**BHARAT HEAVY ELECTRICALS LTD.,**  
**BOILER PLANT UNIT, TIRUCHIRAPALLI-14**

FIRST ANGLE	SCALE	DRAWN	N.P.ESWARAN	TOTAL NET WT. (kg)
	NTS	CHECKED	A.V. [Signature]	TYPE
ALL DIMENSIONS IN MILLIMETRES		APPROVED	N.NAGARAJAN	DATE
				13-08-85

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33-115

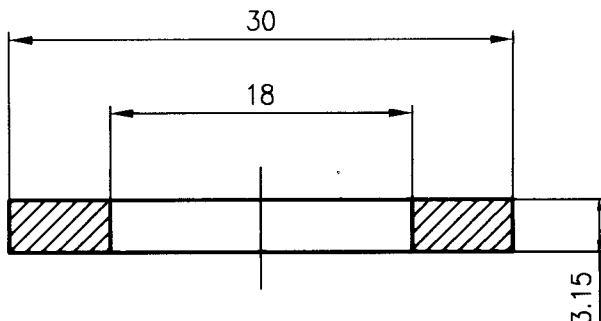
**PLUG**

DRAWING NO. **3V 0000 06413** REVISION **08**

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP/QP

REV	DATE	ALTERED
		CHD & APPD

12.5 /



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01	SUGG. SIZE PL.35x35-5	15011308	SA240 TYPE 304 SH	—	—	0.01	0.05	931079260000	—
NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	COMP. CODE DRAWING No	ITEM No

 BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI 620014. 365-122	DRN	NAME T.R.R.MURTHY	SIGN <i>T.R.R.</i>	DATE 09.05.97	NO. OF VAR
	CHD	N.DHANAPAL	<i>N.D.</i>	09.05.97	
	APPD	A.VISWANATHAN	<i>A.V.</i>	09.5.97	

DEPT VL		SCALE	WEIGHT (KG).	REFERENCE	NO. OF ITEMS
CODE 320		NTS.	—	04-26036	

TITLE	CARD CODE	DRAWING NO.	REV
WASHER	U 01	4-V-P336-26036	

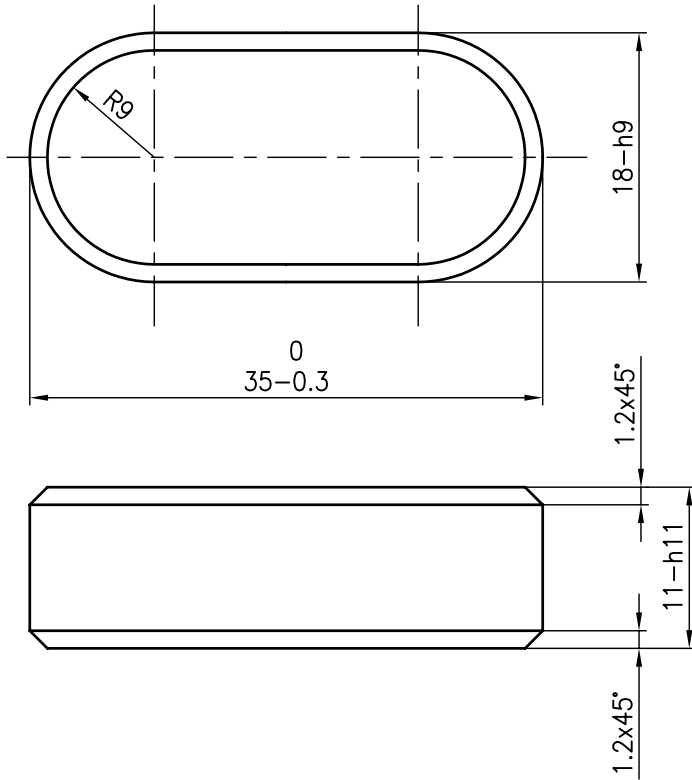
FOR TOLERANCES OF UNTOLERANCED DIMENSIONS

ALL DIMENSIONS ARE IN MILLIMETRES.  
DURING MANUFACTURE REFER RELEVANT QCP/QP

REV	DATE	ALTERED
		CHD & APPD

3.2/

18-h9	0 -0.043
11-H11	0 -0.110



**NOTE:**

HARDNESS REQUIRED IS 220 TO 270 BHN.

COMP.CODE: 931108190000

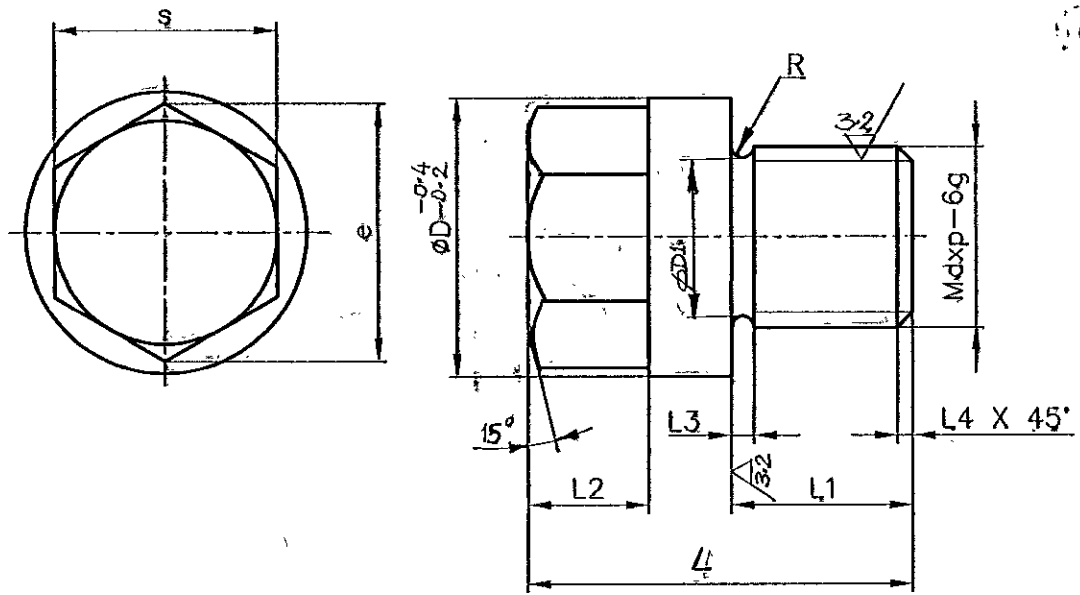
	ø30x40		IS1875 CL.4 CERTIFY	NR	10	0.20	0.67		
NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
<p>365-122</p>	<p><b>BHARAT HEAVY ELECTRICALS LTD.,</b> UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI 620014.</p>			DRN	NAME V.BAIRAVAN		SIGN	DATE 12.4.03	NO.OF VAR
				CHD	R.L.NARAYANAN			12.4.03	
				APPD	M.RAJAKUMAR			12.4.03	
DEPT VL	/		SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS				NO. OF ITEMS
CODE			NTS		C426442				
TITLE PARALLEL KEY					CARD CODE U 01	DRAWING NO. 4-V-NC08-26442			REV 0

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ALL DIMENSIONS ARE IN MILLIMETRES. FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP / QP.

DRAWING NO	SL.No	DRAWING NUMBER	MATL. SPECN	DIMENSIONS											COMPONENT CODE	SCRAP SORT	WEIGHT
				Mdxp-6g	$\phi D_1$	$\phi D_2$	e	s	L	L1	L2	L3	L4	R			
	01	3-V-2021-22675/01	ASTM A193 B7	M48x3	65	45	63.5	55	80	35	38	1.5	2	1.5	931177660000	10	1.68
	02	3-V-2029-22675	ASTM A193 B16	M48x3	65	45	63.5	55	80	35	38	1.5	2	1.5	931178500000	20	1.68

12.5 / 32



NOTES: -  
1. UNSPECIFIED SHARP CORNERS TO BE CHAMFERED TO 0.5X45°.  
2. HARDNESS - 26 TO 32 HRC FOR B7 MATL.

NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
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TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

	BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT, TIRUCHIRAPALLI-620014.		DRN	NAME	SIGN	DATE	NO. OF VAR.
	365-121	VL	CHD	P.R.K.	[Signature]	17.9.99	
		CODE	APPD	SCS	[Signature]	17.9.99	

DEPT	SCALE	WEIGHT (KG)	REFERENCE INFORMATIONS	NO. OF ITEMS
VL	NTS	-		
CODE				
320				
TITLE	CARD CODE	DRAWING NO.	REV	
PLUG	U 01	3-V-0000-22675	02	

REV	DATE	ALTD:	REV	DATE	ALTERED
02	19.8.2000	MPS	01	16.8.2000	MPS
SL. NO. 02 ADDED.		DIMN 'e' 63.5 WAS 54			
DCN:QN:0684					

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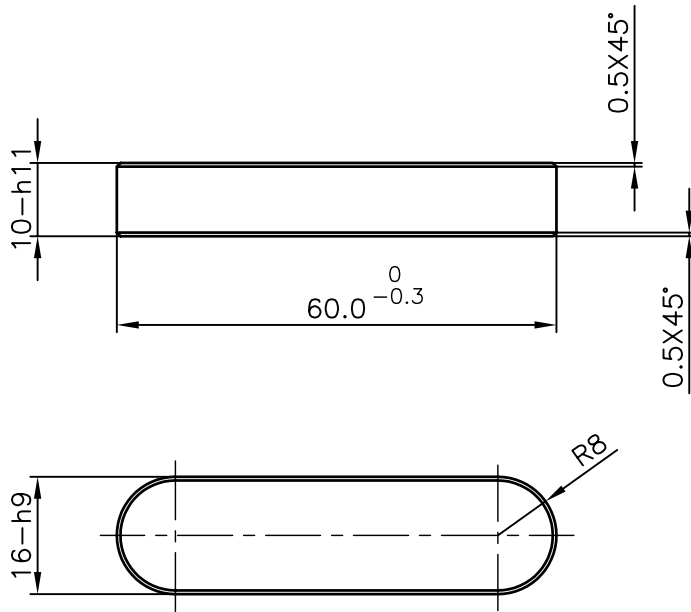
FOR TOLERANCES OF UNTOLERANCED DIMENSIONS

ALL DIMENSIONS ARE IN MILLIMETRES.  
DURING MANUFACTURE REFER RELEVANT QCP/QP

REV	DATE	ALTERED
		CHD & APPD

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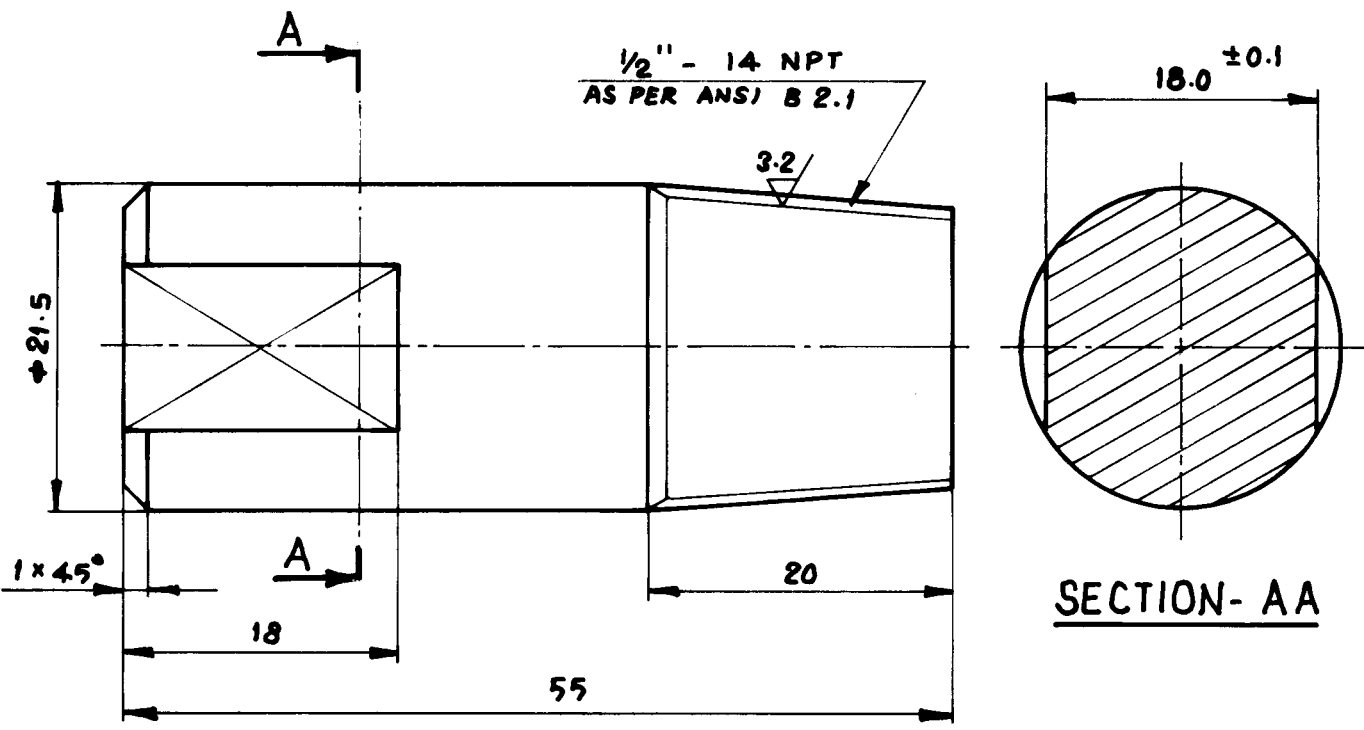
3.2 /



10 - h11	0
	-0.09
16 - h9	0
	-0.043

01	SUGG. MIN.SIZE DIA20 X 70	--	ASTM A193 B7-CERTIFY	NT	20	0.07	0.17	-	023	
NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No	
		BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI 620014.			DRN	NAME M.SRINIVASAN		SIGN	DATE 25.09.06	NO.OF VAR
365-122					CHD	P.B.NATHAN			25.09.06	
					APPD	M.RAJAKUMAR			25.09.06	
DEPT VL	/		SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS				NO. OF ITEMS	
CODE 320			NTS	0.07	COMP. CODE: 93 130 912 0000 CAD :C426664					
TITLE KEY					CARD CODE U 01	DRAWING NO. 4-V-P366-26664			REV	

6.3 / 3.2



01	BAR $\phi$ 22 x 60	15339 343	SA 105	NORMALISED	ID	0.15	0.18	33116 502-0000 4-V-M305-06587
NO. OF PIECES	DESCRIPTION	MATL. CODE	FINAL MATERIAL	HEAT TREATMENT	SCRAP SORT	NET Wt (kg)	GROSS Wt (kg)	COMPONENT CODE DRAWING No.
REMARKS				TOTAL NET Wt (kg)				
NTS	SCALE	DRAWN	14. <i>[Signature]</i>	ALTERATIONS		DATE	SIGNATURE	ALTERATION INDEX
		CHECKED						
		APPROVED	N. NAGARAJAN. <i>[Signature]</i>					
		STDS. OFFICER		TRANS. COPY NO.				
		DATE	14-11-90					
TYPE		GROUP		OLD DRG.		NEW DRG.		
TITLE		PLUG		DRAWING NO.		4-V-M305-06587		

