

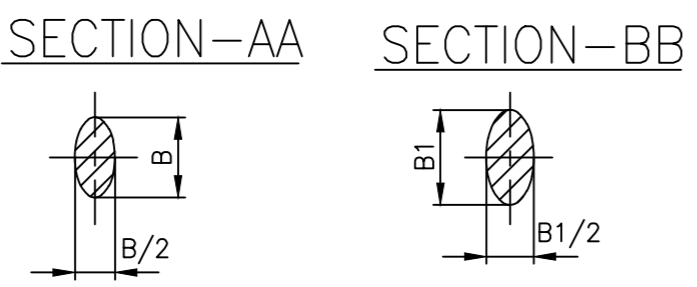
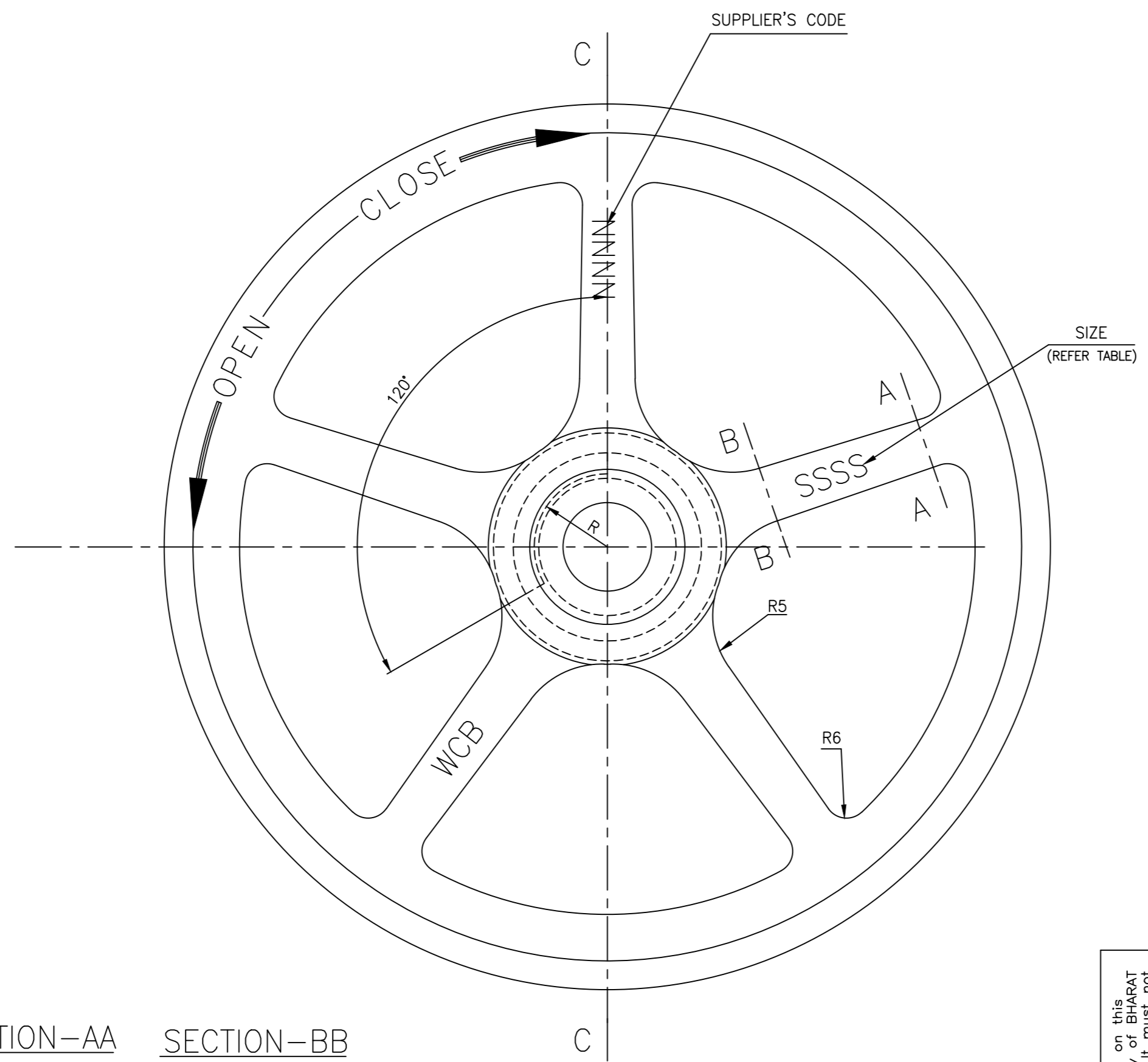
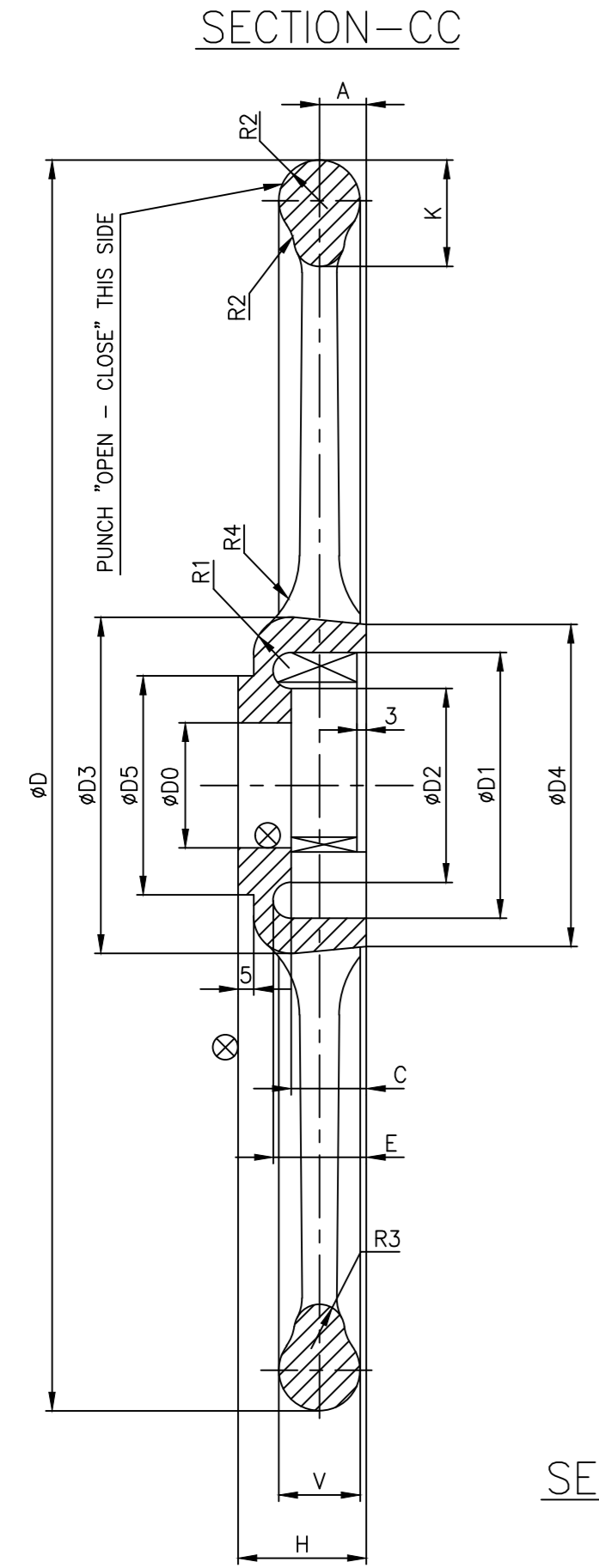
2-V-0000-06166R
DRAWING NO.

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

SL.No.	DRAWING No.	MATL. SPECN.	MATL. CODE	DIMENSIONS																				No.OF ARMS (NOTE-6)	L (mm)	Wt. (kg)	SIZE	DIA. OF SPINDLE ϕd		
				ϕD	H	$\phi D0$	$\phi D1$	$\phi D2$	$\phi D3$	$\phi D4$	$\phi D5$	R	R1	A	C	E	K	V	R2	R3	B	B1	R4						R5	R6
01	2-V-K648-06166R/03	A216 WCB (CERTIFY) NORMALISED	92 010 040	400	41	40	85	62	110	103	70	33	12	15	24	31	34	26	13	8	22	26	30	40	10	4	10	9.44	400	32
02	2-V-K649-06166R/03		92 200 544	450	45	48	100	75	130	123	80	40	15	17	26	33	38	28	14	8	26	30	30	45	12	4	10	11.99	450	36
03	2-V-K650-06166R/03		92 010 059	500	45	48	100	75	130	123	80	40	15	17	26	33	38	28	14	8	26	30	35	45	12	5	12	15.2	500	40
04	2-V-K651-06166R/03		92 200 545	560	50	58	110	85	145	138	90	45	18	19	28	37	40	30	15	10	26	30	35	30	12	5	12	17.69	560	44
05	2-V-K652-06166R/03		92 200 546	630	50	58	110	85	145	138	90	45	18	19	28	37	40	30	15	10	26	30	40	30	12	6	12	20.0	630	48
06	2-V-K653-06166R/03		92 200 547	710	56	85	125	100	165	158	110	53	20	21	30	38	43	32	16	10	30	36	40	30	12	6	16	26.1	710	52

NOTES:

- ⊗ INDICATES SURFACES TO BE MACHINED. ALL OTHER SURFACES SHALL BE CAST AS SMOOTH AS POSSIBLE, THE PERMISSIBLE SURFACE ROUGHNESS BEING 100 MICRONS MAXIMUM.
- THE CASTING SHALL BE FREE FROM BURRS SHARP EDGES OR UNEVENNESS, BLOW HOLES AND ALL OTHER INTERNAL AND EXTERNAL CASTING DEFECTS.
- UNSPECIFIED CASTING RADIUS R5 MAXIMUM.
- CASTING SHALL COMPLY WITH REQUIREMENTS OF LATEST APPLICABLE QUALITY PROCEDURE
- PERMISSIBLE DEVIATIONS OF NON-TOLERANCED CASTING DIMENSIONS REFER LATEST APPLICABLE QUALITY PROCEDURE
- L = CASTING EMBOSSING LETTER HEIGHT IN MM.
- ALTERNATIVELY, IS 14329 GR.BM 320 OR IS 1865 SG 450/10, CERTIFY, CAN BE ACCEPTABLE.



REV	DATE	ALTERED	P.NALLATHAMBI	REV	DATE	ALTERED	K.P.LEON
04	23.11.12	CHD & APPD	S.S.K & K.R.S	03	25.04.05	CHD & APPD	P. BOOMINATHAN

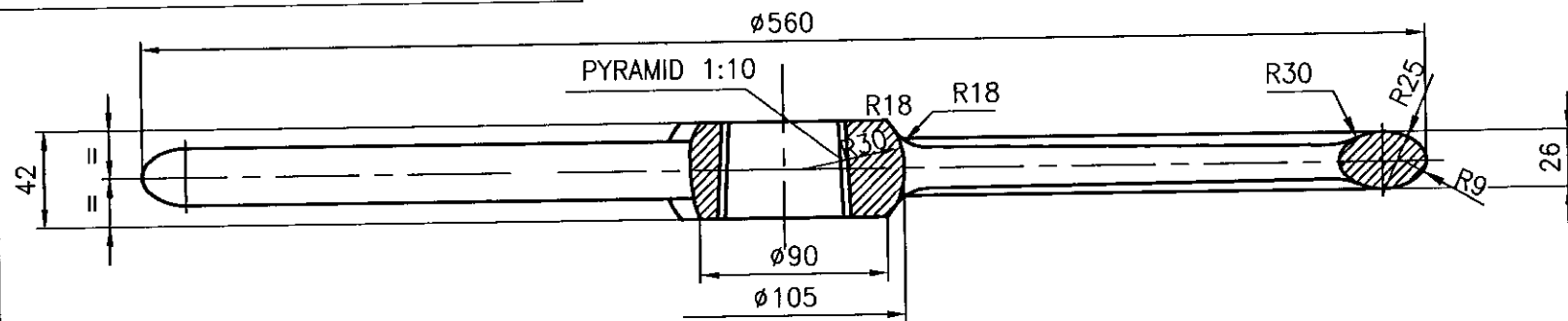
NOTES ADDEED. DCP: 801417

DRAWING UPDATED.

No OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
	TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT							CS	
	DRAWING REDRAWN WITH REV. 03 ON 25.04.2005 (REF. DCN:CS:1113)								
	BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI -620014.			DRN	K.P.LEON	SIGN		DATE	NO.OF VAR.
				CHD	T.R.RAMAMURTHY			25.04.05	
				APPD	P. BOOMINATHAN			25.04.05	
	DEPT VL	SCALE N.T.S.	WEIGHT (KG)	REFERENCE INFORMATION			NO. OF ITEMS		
	CODE 320		REF.TABLE	CAD:C206166R					
	TITLE				CARD CODE	DRAWING NO.		REV	
	HAND WHEEL (IMPACT)				U 01	2-V-0000-06166R		04	

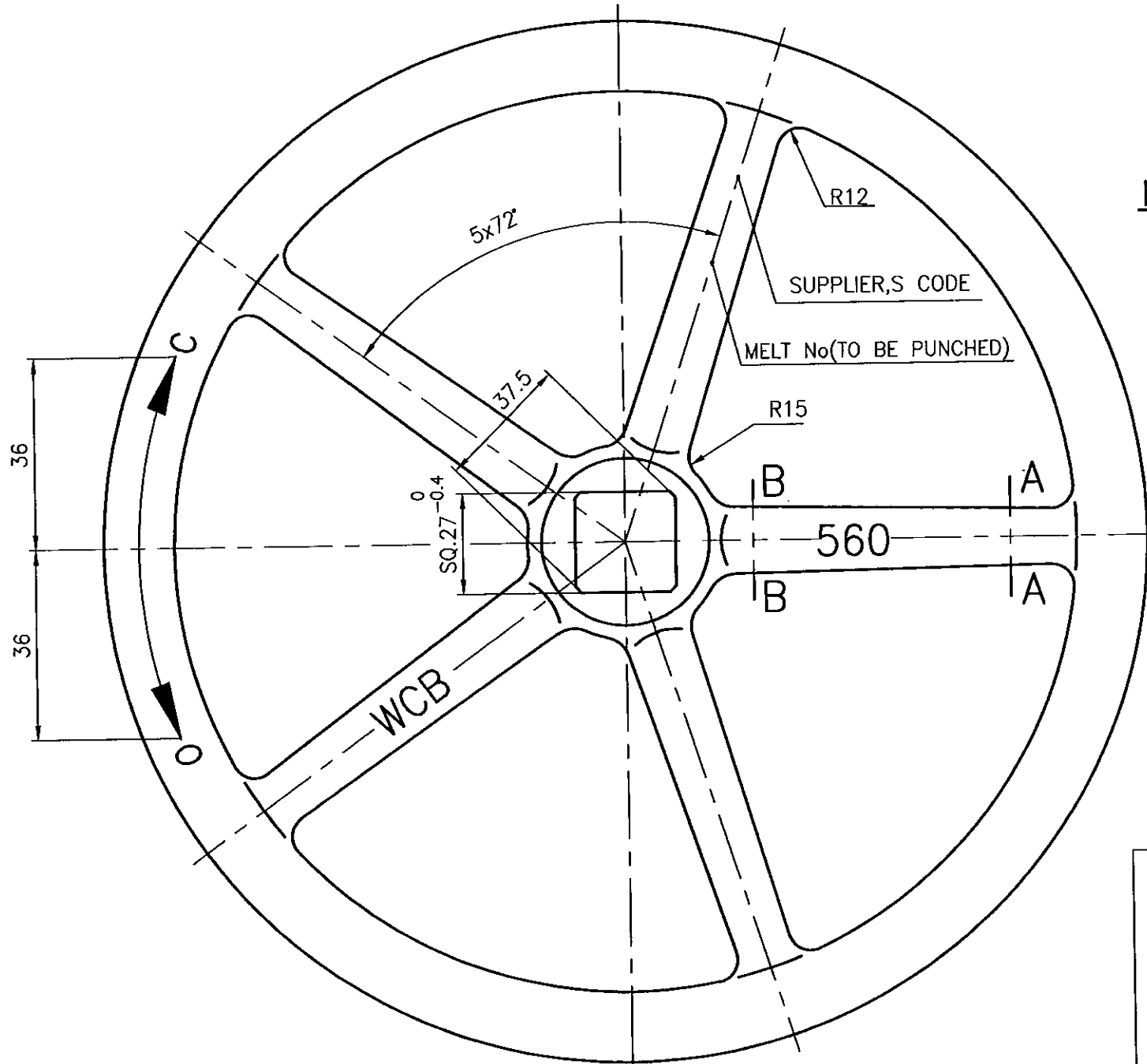
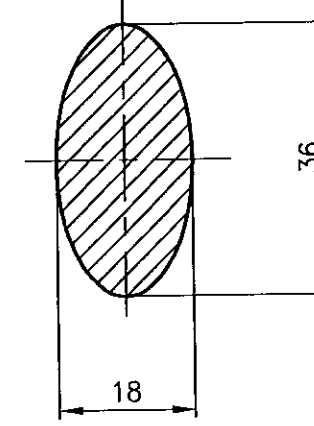
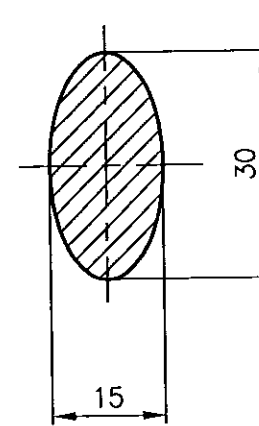
CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

3-V-2480-03010R/01
DRAWING NO.



SECTION-AA

SECTION-BB



NOTE:-

1. CASTING SHALL COMPLY WITH REQUIREMENT OF APPLICABLE QUALITY PROCEDURE.
2. ALL SURFACES MUST BE OF HIGH QUALITY WITH OUT SURFACE UNEVENNESS.
3. HEIGHT OF CAST LETTERS 12 MM.
4. * TOLERANCE TO BE MAINTAINED IN THE FINISHED HAND WHEEL MAINTAINED BY FILING THE PYRAMIDAL HOLE NEATLY.
5. MATERIAL MARK, HAND WHEEL SIZE 560, OPENING & CLOSING MARK "O" & "C" AND THE ARROW MARKS ARE TO BE CAST.



NO OFF	CASTING	92 010 087	A216 WCB CERTIFY	NR	10		14.0		
	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

CS

Bharat Heavy Electricals Ltd. Logo	BHARAT HEAVY ELECTRICALS LTD.,	DRN	T.R.R.MURTHY	SIGN	DATE	NO. OF VAR.
	UNIT: HIGH PRESSURE BOILER PLANT.	CHD	N.DHANAPAL		20.06.97	
	TIRUCHIRAPALLI-620014.	APPD	A.V.NATHAN		20.06.97	

DEPT	VL	SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS	NO. OF ITEMS
365-121		NTS	-	CAD.CODE.C303010R	

REV	DATE	ALTERED
01	23.06.97	CHD & APPD

MATL SPECN IS 2108 Gr.A CHANGED AS A216 WCB
REFER DCN CS: 0718

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

TITLE	CARD CODE	DRAWING NO.	REV
HAND WHEEL Ø560	U 01	3-V-2480-03010R	01



PLANT STANDARD

HPBP TIRUCHIRAPPALLI

BPS 419026

Rev. No. 02

PAGE 01 OF 03

HANDWHEEL WITH PYRAMID HOLE (DIA 200 mm AND ABOVE)

0.0 SCOPE

0.1 This standard covers the requirements of off-set arm type handwheel with pyramid hole for sizes \varnothing 200 mm and above.

1.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and preferred sizes	Figure 1 and Table 1 of this standard
Unspecified tolerances	As per relevant QWI
Material	Malleable Iron casting conforming to IS:14329
Surface finish	The surface should be smooth. Should be free from sharp edges and unevenness.
Marking (by embossing)	As shown in figure 1.
Manufacture, workmanship, Packing, Preservation and other requirements	As per relevant quality procedures.

2.0 REFERRED STANDARDS (Only current versions are applicable)

IS : 14329 - Malleable iron castings.

3.0 DESIGNATION

3.1 A hand wheel of rim diameter 250 mm shall be designated as :

- i) Material spec column : -----
- ii) Description column : **HAND WHEEL 250**
- iii) Drawing No. column : **BPS 419026**
- iv) Material code column : -----

4.0 ORDERING DESCRIPTION

4.1 For placing indents, issuing enquiries and on purchase order, ordering description given below shall be followed.

HAND WHEEL 250 TO BPS 419026

Revisions 02
Brought upto date

Approved
STANDARDS SECTION
PRODUCT ENGINEERING/ FOSSILE BOILER
HPBP, TIRUCHIRAPPALLI

Rev. No. 02

Amd. No.

Reaffirmed

Prepared
STANDARDS

Issued
STANDARDS

Dt of 1st Issue
MAY 1977

Dt. 30-06-2000

Dt.

Year



PLANT STANDARD

HPBP TIRUCHIRAPPALLI

BPS 419026

Rev. No. 02

PAGE 02 OF 03

5.0 ADDITIONAL INFORMATION

5.1 Copies of this standard shall be sent along with purchase order.

TABLE - 1

(All dimensions are in millimetres)

Rim ϕ of handwheel	ϕD	200	250	315	400	450	500	560	710	
Dia of corresponding spindle	ϕd	20	24	28	32	36	40	44	52	
Height of handwheel	H	24	28	32	37	42	47	52	62	
Hub	S	15	18	21	24	27	30	33	39	
		+ 0.0 - 0.3			+ 0.0 - 0.4					
	e	20.8	25	29	33.5	37.5	41.5	46	53	
	ϕd_1	40	60	68	70	70	70	90	110	
	ϕd_2	45	66	75	80	80	80	105	125	
	r_3	10	12	12	15	15	15	15	15	
Rim	r_6	28	28	30	30	30	30	30	40	
	V	18	20	22	23	24	24	26	40	
	k	24	26	30	34	36	36	38	60	
	r_1	6	7	7	8	9	9	9	15	
	r_4	16	16	18	20	22	24	24	26	
	r_5	16	18	20	24	27	30	30	36	
Arm	l_1	56	60	60	68	72	72	72	80	
	b	18	20	22	26	30	30	30	38	
	b_1	24	26	28	34	36	36	36	46	
	r_2	6	8	10	11	12	12	12	15	
No. of arms	θ	120°	120°	120°	90°	90°	90°	72°	51.43°	
Letter size (height) for embossing	N	3	3	3	4	4	4	5	7	
Weight in Kg/piece	l	8	8	10	10	12	12	12	15	
		2.0	2.3	4.0	5.4	7.0	12.8	14.0	38.0	



PLANT STANDARD

HPBP TIRUCHIRAPPALLI

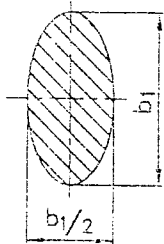
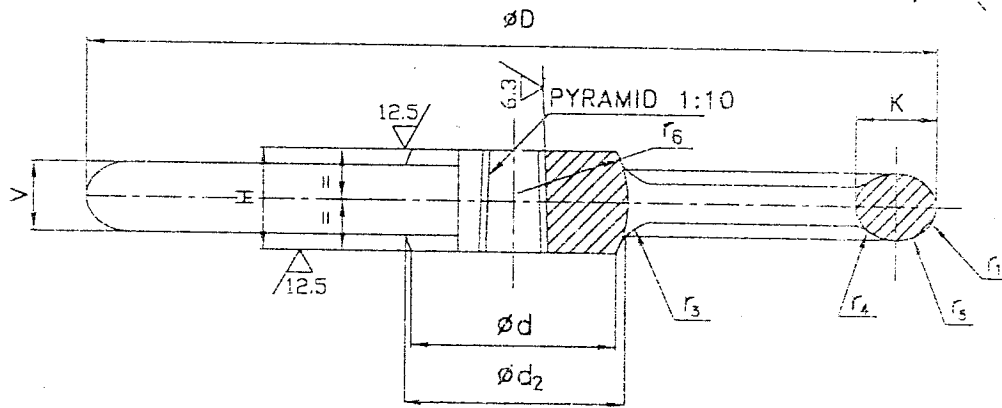
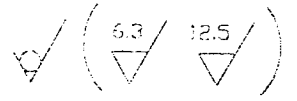
BPS 419026

Rev. No. 02

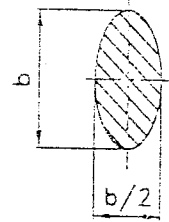
PAGE 03 OF 03

Figure-1

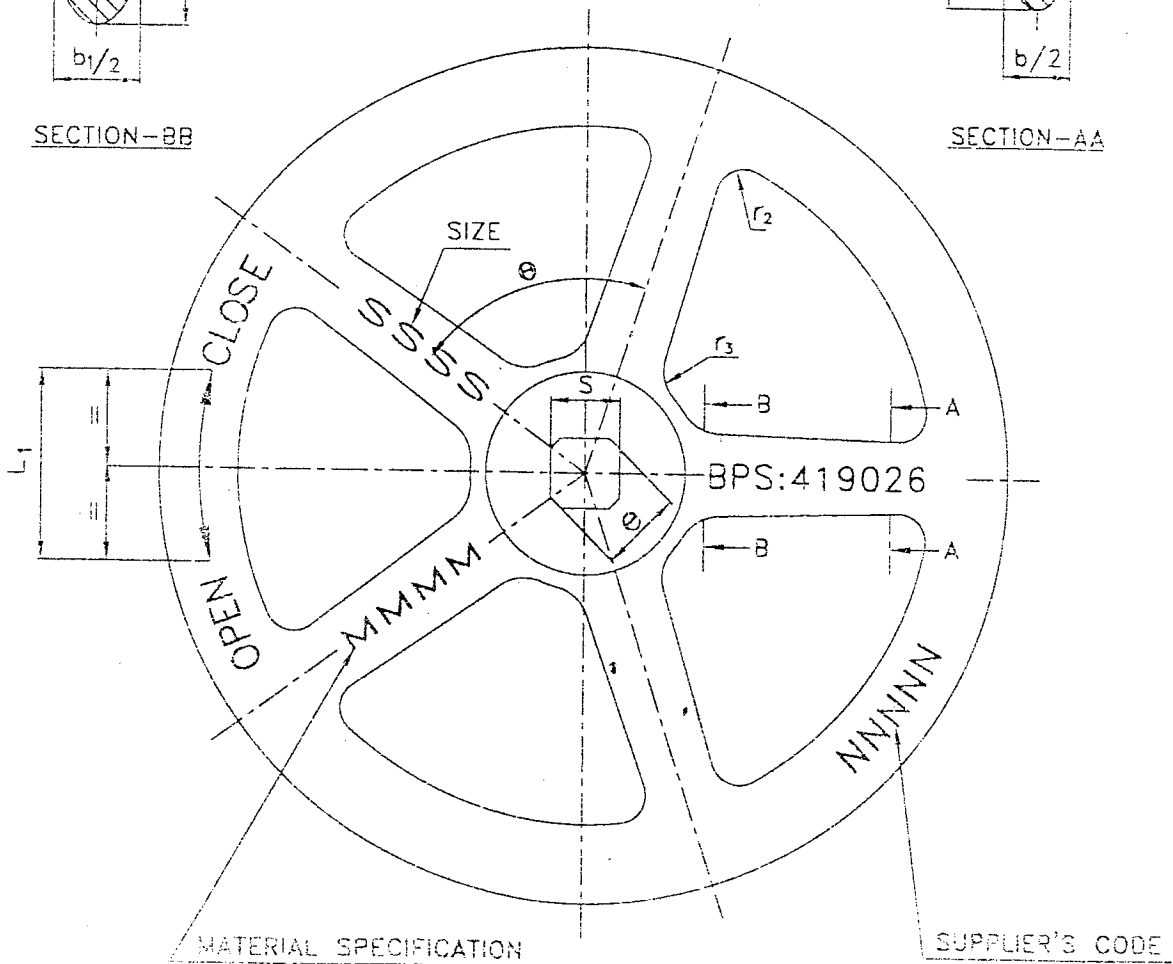
(ALL DIMENSIONS ARE IN MILLIMETRES)
(First Angle Projection)



SECTION-BB



SECTION-AA



Note : Size, Material spec and supplier's code are to be given in the purchase order for embossing.



PLANT STANDARD

HPBP TIRUCHIRAPPALLI

BPS 419027

Rev. No. 02

PAGE 01 OF 03

HANDWHEEL WITH CIRCULAR HOLE AND KEYWAY (Dia 250 mm AND ABOVE)

0.0 SCOPE

0.1 This standard covers the requirements of handwheels with circular hole for dia 250 mm and above.

1.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and preferred sizes	Fig 1 and Table 1 of this standard
Unspecified tolerance	As per relevant QWI
Material	Malleable Iron castings conforming to IS:14329 or S.G.Iron conforming to GR. 450/10 of IS:1865
Surface finish	The surface should be smooth. Should be free from sharp edges and unevenness.
Marking (by embossing)	As shown in figure 1.
Manufacture, workmanship, Packing, Preservation and other requirements	As per relevant quality procedures.

2.0 REFERRED STANDARDS (Only current versions are applicable)

IS : 14329 - Malleable iron castings.

IS : 1865 - Iron castings with spheroidal or nodular graphite - specification.

3.0 DESIGNATION

3.1 A hand wheel of rim diameter 250 mm shall be designated as :

- i) Material spec column : -----
- ii) Description column : **HAND WHEEL 250**
- iii) Drawing No. column : **BPS 419027**
- iv) Material code column : -----

4.0 ORDERING DESCRIPTION

4.1 For placing indents, issuing enquiries and on purchase order, ordering description given below shall be followed.

HAND WHEEL 250 TO BPS 419027

Revisions 02 Brought upto date			Approved STANDARDS SECTION PRODUCT ENGINEERING/ FOSSILE BOILER HPBP. TIRUCHIRAPPALLI		
Rev. No. 02	Amd. No.	Reaffirmed	Prepared	Issued	Dt of 1st Issue
Dt. 30-06-2000	Dt.	Year	STANDARDS	STANDARDS	1978



PLANT STANDARD

HPBP TIRUCHIRAPPALLI

BPS 419027

Rev. No. 02

PAGE 02 OF 03

5.0 ADDITIONAL INFORMATION

5.1 Copies of this standard shall be sent along with purchase order.

Table - 1

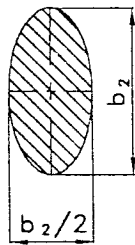
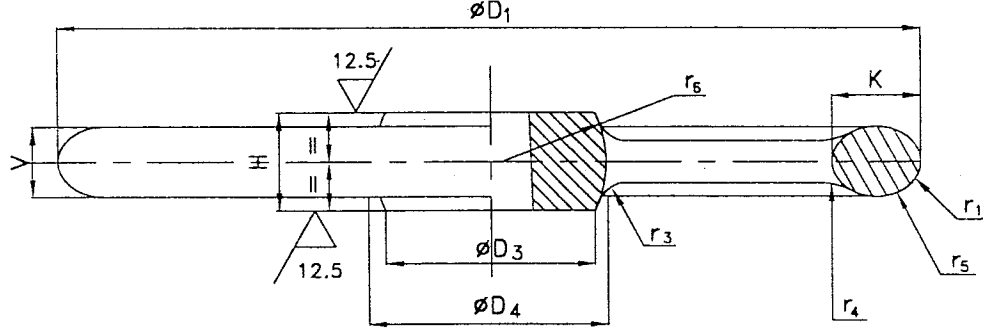
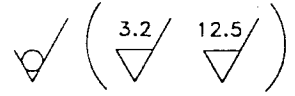
(All dimensions are in millimetres)

Rim of hand wheel	ϕD_1	250	315	400	450	500	560	710
Dia of corresponding stem		20 & 24	26 & 28	32	36 & 40	40	44	52
Hub	H	28	32	37	42	47	52	62
	ϕD_2	40	45	52	60	65	70	80
		+0.16 0.0				+ 0.190 0.0		
	ϕD_3	60	68	75	90	100	110	130
	ϕD_4	66	75	88	105	115	125	150
r_6	28	30						40
Key Way	L_1	12	14	16	18	20	20	22
		- 0.018 - 0.061				- 0.022 - 0.074		
	L_2	43.3	48.8	56.3	64.4	69.9	74.9	85.9
Rim	V	20	22	23	24	24	26	40
	K	26	30	34	36	36	38	60
	r_1	7	7	8	9	9	9	15
	r_5	18	20	24	27	30	30	36
	L_3	60	60	68	72	72	72	80
Arm	b_1	20	22	26	30	30	30	38
	b_2	26	28	34	36	36	36	46
	r_2	8	10	11	12	12	12	15
	r_3	12			15			
	r_4	16	18	20	22	24	24	26
	θ	120°	120°	72°	72°	72°	72°	≈51.43°
Number of arms		3	3'	5	5	5	5	7
Letter size (height)	L_4	8	10	10	12	12	12	15
Weight in Kg/piece (approx)		3.8	5.7	9.18	11.57	16.3	18.00	65.00

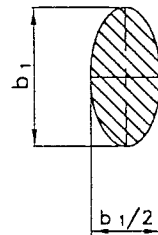
Figure-1

(ALL DIMENSIONS ARE IN MILLIMETRES)

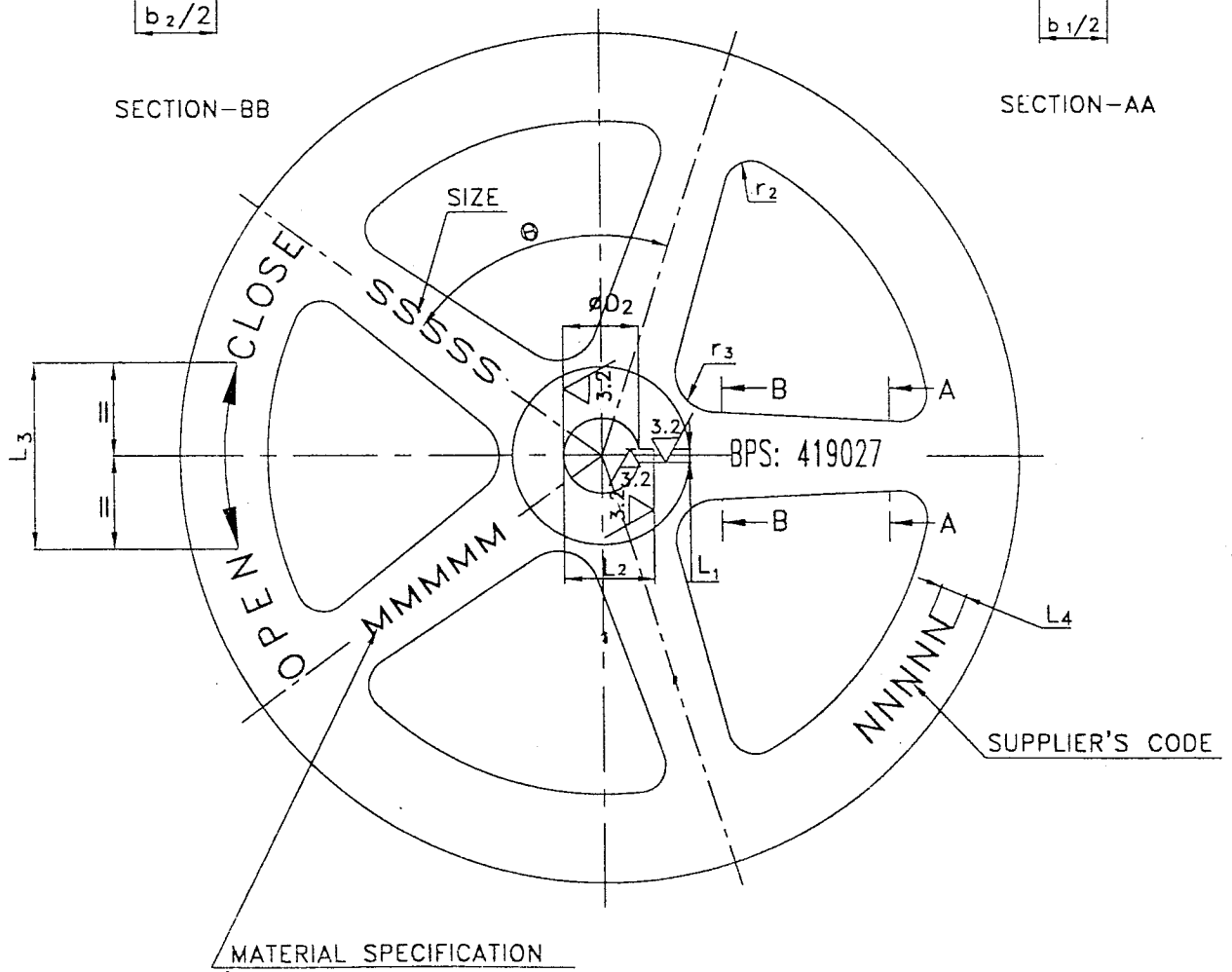
(First Angle Projection)



SECTION-BB



SECTION-AA



Note : Size, Material spec. and supplier's code are to be given in the purchase order for embossing.

ANNEXURE-II

Techno-Commercial/Unprice Bid Annexure to Tender Enquiry 1617-032 E dated 06.06.2016 with due date 17.06.2016

Enq Sl. No.	Code	Description of material	Drg No	Quoted (Yes/No)	Qty (Nos)	Unit Basic Price, Rs. per No.
1	920100800000	HAND WHEEL-BPS 419027-DIA 250	BPS 419027	Yes/No	700	Please see price bid
2	920090240000	HAND WHEEL-BPS 419026-DIA 315	BPS 419026	Yes/No	500	Please see price bid
3	920090550000	HAND WHEEL-BPS 419027-DIA 450	BPS 419027	Yes/No	300	Please see price bid
4	920090540000	HAND WHEEL-BPS 419027-DIA 400	BPS 419027	Yes/No	300	Please see price bid
5	920090530000	HAND WHEEL-BPS 419027-DIA 315	BPS 419027	Yes/No	150	Please see price bid
6	920100870000	HAND WHEEL-2480-DIA 560 - RV	3V248003010R/01	Yes/No	170	Please see price bid
7	920100590000	HAND WHEEL (IMPACT)-DIA 500	2VK65006166R/03	Yes/No	100	Please see price bid
8	920090230000	HAND WHEEL-BPS 419026-DIA 250	BPS 419026	Yes/No	100	Please see price bid

Excise Duty rate (mention in % if applicable, mention as **NIL** if not applicable)

Cess on ED rate (mention in % if applicable)

CST (%) / VAT (%)

Validity of offers (**As per BHEL terms 90 days validity is required**)

The above prices are **Firm, without any price escalation; are Rs. per piece; and are on FOR Goindwal Sahib basis.**

We accept all terms and conditions of the Tender Enquiry 1617-032 E dated 06.06.2016 with due date 17.06.2016

Authorised signatory with seal