



BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)

HIGH PRESSURE BOILER PLANT
PURCHASE DEPARTMENT - FOSSIL BOILERS
THIRUCHIRAPALLI - 620014
TAMILNADU (INDIA)

PHONE :2577938
GRAMS : BHARATELEC
FAX NO: 2520719
E-mail: tvenkat@bheltry.co.in
Web:

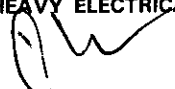
429-002/A

	Enquiry No 2661600247 - 55	Enquiry Date 30.06.2016	Due Date for Quotation 25.07.2016
<p>Please quote Enquiry No, Date and due date in all correspondences. This is only a request for quotation and not an order. Bid should be submitted in two parts. 1.Techno-commercial bid (Part-I) and 2.Price bid(Part-II) in a separate sealed cover and both covers must be placed in a third cover and sealed. Our Enquiry No., Enq. date & Enq. Due date must be written on all three covers.</p>			

Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	<p>WORM WHEEL AS PER DRG: 3-M-01B20-11448. ✓ NOTE:ITEM NO 10 AND 20 ARE MATTING COMPONENTS. Common note for All items: 1. Mating components shall be awarded to single supplier for proper matching of components. 2. All items are to be neatly separately packed with Title, drawing no, Machine/Eqpt name identification tag on it. 3. Items (Wherever applicable) are to be individually packed with zip lock cover. VENDOR QUALIFYING CRITERIA Only those vendors who satisfy the following conditions will get qualified to participate in the tender: 1. Vendor should have minimum 2 years of experience in this field. 2. Previous PO details for supplying similar kind of items to BHEL and/or any-other Organization should be submitted along with offer. (Otherwise offer is liable for rejection) 3. Company profile details has to be provided along with offer. 4. BHEL may visit/check the vendor's works for verifying the manufacturing facilities and any other credential furnished by the vend or. In case the information furnished with the offers found to be false /incorrect, the offer shall be rejected.</p>	NO	1.000	1.00	31.10.16
20	WORM SHAFT AS PER DRG: 3-M-01B20-11449. ✓	NO	1.000	1.00	31.10.16
30	WORM WHEEL AS PER DRG: 4-M-08B24-29776 NOTE:ITEM NO 30 AND 40 ARE MATTING COMPONENTS. ✓	NO	2.000	2.00	31.10.16
40	WORM SHAFT AS PER DRG: 4-M-08B24-29777. ✓	NO	2.000	2.00	31.10.16
50		NO	2.000	2.00	31.10.16

The offers should reach us 30 minutes before the time of opening of tenders. The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening. Late and delayed offers are liable to be rejected.

V. CHELLIAH
Sr Manager / Purchase
MM / RM / CP & SP
BHEL, TRICHY - 620 014.

Yours faithfully,
For BHARAT HEAVY ELECTRICALS LIMITED

MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,



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E-mail: tvenkat@bheltry.co.in
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2661600247 / 30.06.2016

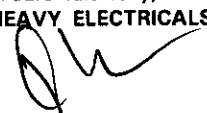
23505

60	BEVEL GEAR AS PER DRG: 4-M-07B08-28330 NOTE:ITEM NO 50,60 AND 70 ARE MATTING COMPONENTS.	NO	2.000	2.00	31.10.16
70	BEVEL GEAR AS PER DRG: 4-M-07B08-28328	NO	2.000	2.00	31.10.16
80	SPUR GEAR DRG :4-M-07B08-28329	NO	1.000	1.00	31.10.16
90	SHAFT AS PER DRG: 3-M-08D08-8027.	NO	3.000	3.00	31.10.16
100	BOX NUT AS PER DRG 3-M-01A11-15210 NOTE:ITEM NO 90 AND 100 ARE MATTING COMPONENTS.	NO	3.000	3.00	31.10.16
110	SAFETY NUT AS PER DRG 3-M-01A11-15212.	NO	1.000	1.00	31.10.16
120	WORM WHEEL AS PER DRG: 4-M-10B48-29692. NOTE:ITEM NO 110 AND 120 ARE MATTING COMPONENTS.	NO	1.000	1.00	31.10.16
130	WORM SHAFT AS PER DRG:3-M-10B48-15115.	NO	2.000	2.00	31.10.16
140	SPUR GEAR AS PER DRG: 4-M-07B14-29793	NO	2.000	2.00	31.10.16
150	SPUR GEAR AS PER DRG: 4-M-07B14-29797	NO	2.000	2.00	31.10.16
160	WORM WHEEL AS PER DRG 4-M-08F11-29823. NOTE:ITEM NO 150 AND 160 ARE MATTING COMPONENTS.	NO	2.000	2.00	31.10.16
170	WORM SHAFT AS PER DRG 4-M-08F11-29824	NO	3.000	3.00	31.10.16
180	PINION SHAFT DRG : 3-M-08F11-12316. NOTE:ITEM NO 170 AND 180 ARE MATTING COMPONENTS.	NO	3.000	3.00	31.10.16
190	RACK AS PER DRG: 3-M-08F11-12317.	NO	10.000	10.00	31.10.16
200	PLUNGER AS PER DRG:4-M-08D08-29812	NO	2.000	2.00	31.10.16
210	BEVEL GEAR AS PER DRG: 4-M-07B08-28428. NOTE:ITEM NO 200 AND 210 ARE MATTING COMPONENTS.	NO	2.000	2.00	31.10.16
220	BEVEL GEAR AS PER DRG: 4-M-07B08-28429.	NO	1.000	1.00	31.10.16
	SPUR GEAR AS PER DRG: 4-M-08A01-1834.				

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Item No.	Description	Quantity	Unit	Rate	Amount	Delivery Date
230	NOTE:ITEM NO 220 TO 290 ARE MATTING COMPONENTS. SPUR GEAR AS PER DRG: 4-M-08A01-1835	1.000	NO	1.00	1.00	31.10.16
240	SPUR GEAR AS PER DRG: 4-M-08A01-1836	1.000	NO	1.00	1.00	31.10.16
250	SPUR GEAR AS PER DRG: 4-M-08A02-1957.	1.000	NO	1.00	1.00	31.10.16
260	SPUR GEAR AS PER DRG: 4-M-08A02-1958.	1.000	NO	1.00	1.00	31.10.16
270	SPUR GEAR AS PER DRG: 4-M-08A02-1959	1.000	NO	1.00	1.00	31.10.16
280	SPUR GEAR AS PER DRG: 4-M-08A02-1961	1.000	NO	1.00	1.00	31.10.16
290	SPUR GEAR AS PER DRG: 4-M-08A02-1962.	1.000	NO	1.00	1.00	31.10.16
300	SEGMENT (TOOL DRAWBAR ASSY) AS PER DRG:4-M-14A02-29831.	4.000	NO	4.00	4.00	31.10.16
310	WORM SHAFT DRG 4-M-08F12-27960 Item No: 310 to 340 are mating components.	2.000	NO	2.00	2.00	31.10.16
320	WORM WHEEL DRG 4-M-08F12-27961	2.000	NO	2.00	2.00	31.10.16
330	SPLINE FLANGE DRG 3-M-08F12-14434	2.000	NO	2.00	2.00	31.10.16
340	SPLINE SHAFT AS PER DRG 3-M-08F12-12371-01 Item No: 310 to 340 are mating components.	2.000	NO	2.00	2.00	31.10.16

General Note:

GENERAL NOTE:PLEASE SUBMIT YOUR OFFER IN "TWO PART BID SYSTEM" AS PER THE ANNEXURES ENCLOSED.

ENCLOSURES:ANNEXURE II,III,IV,V,VI,VII

All the tenders may be addressed to the following address:

**The Tender Opening Cell / MM
Room No: 26, Building 24, Ground Floor
Bharat Heavy Electricals Limited
TIRUCHIRAPALLI 620014**


In case personal delivery of the offer, it shall be dropped into the respective box kept in Room No: 26, after duly entering the data in the system.

Offers will be accepted only up to 14.00 Hrs on the due date. Therefore, vendors shall ensure to submit

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Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**

V. CHELLIAH
Sr Manager / Purchase
MM / RM / CP & SP
BHEL, TRICHY - 620 014.


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23505

the offers well before this time. All due date extension requirements should be addressed to the respective Purchase mail IDs. All the due date extension requests from vendors will be considered only up to 48 hours before the due date and time.

Vendors are requested to avoid submission of offers through e mail / fax. In case of any unavoidable situation, offers shall be sent through e mail to the following mail ID only tender_cell@bheltry.co.in.

As tenders are being opened by Common Tender Opening Cell, offer covers should be sealed with tenderer's distinctive seal and super scribed with correct Tender No. item of supply and due date of opening.

The offers will be opened at 14.30 hrs on the due date of the tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening. Late and delayed offers are liable to be rejected.

The bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL fraud prevention policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice.

The supplier shall submit EI/EII forms to BHEL time to time as indicated by the BHEL and in case of inordinate delay in issuing EI/EII forms, then BHEL reserves the right to deduct 5% of the value of the supplied items against which EI/EII forms pending to be issued


Enclosures:

"LD clause has to be confirmed without fail."

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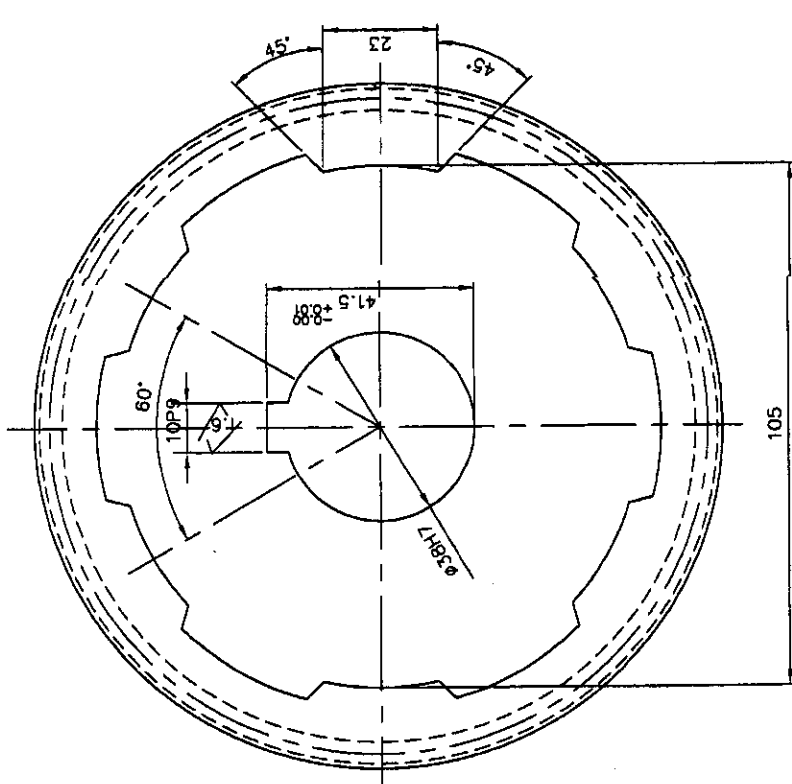
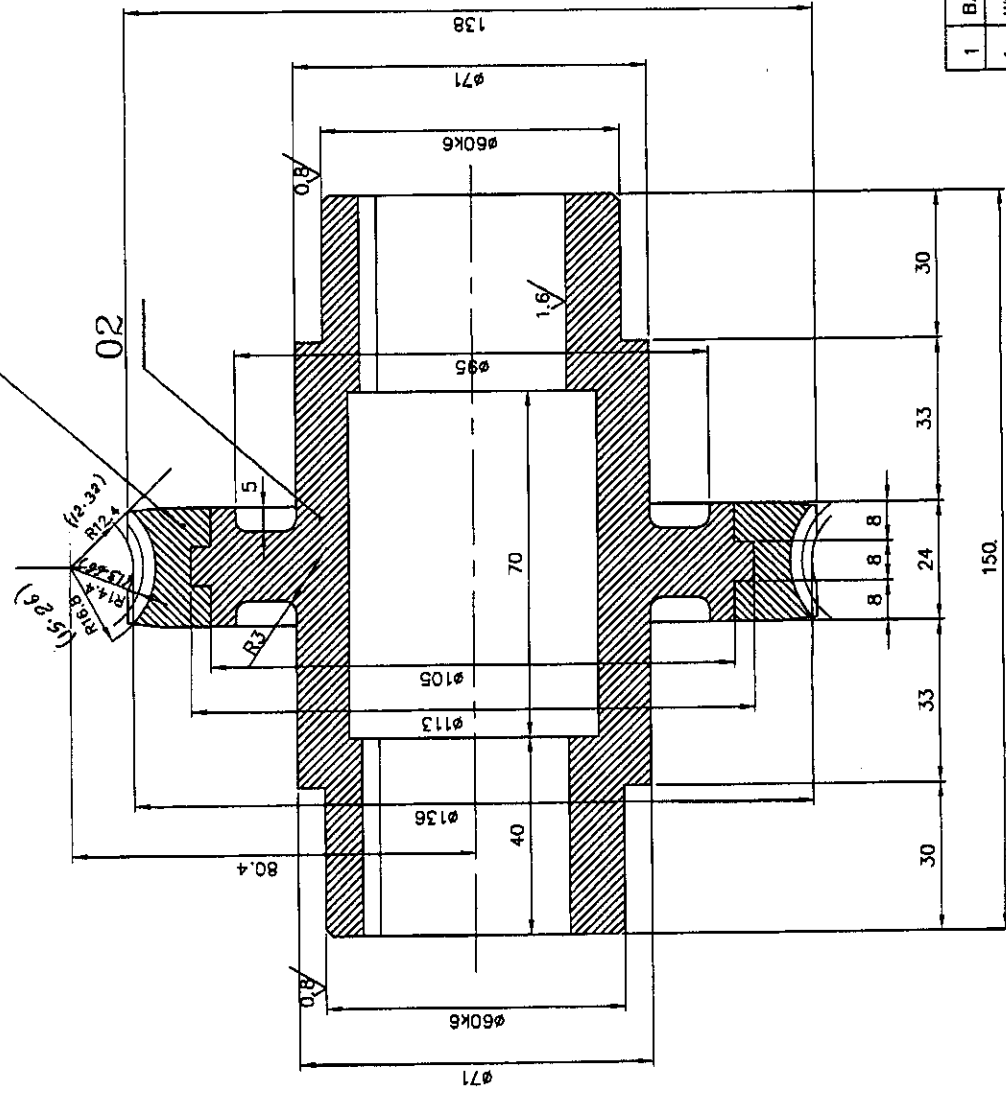
Yours faithfully,
For BHARAT HEAVY ELECTRICALS LIMITED

V. CHELLIAH
Sr Manager / Purchase
MM / RM / CP & SP
BHEL, TRICHY . 620 014.


MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,

CAUTION: THIS DRAWING IS OUR SOLE PROPERTY AND SHOULD NOT BE USED IN ANY FORM FOR ANY PURPOSE WITHOUT THE WRITTEN PERMISSION OF SHAWBT HEAVY ELECTRICALS LIMITED. TRICHOGRAPHALL - 620 014.

ALL DIMENSIONS ARE IN MM



±0.021	10P9	-0.015
+0.002		-0.051
	φ38H7	+0.025
		+0.000

3.2/1.9/0.8

CHAMFER ALL SHARP CORNERS TO 1/45°

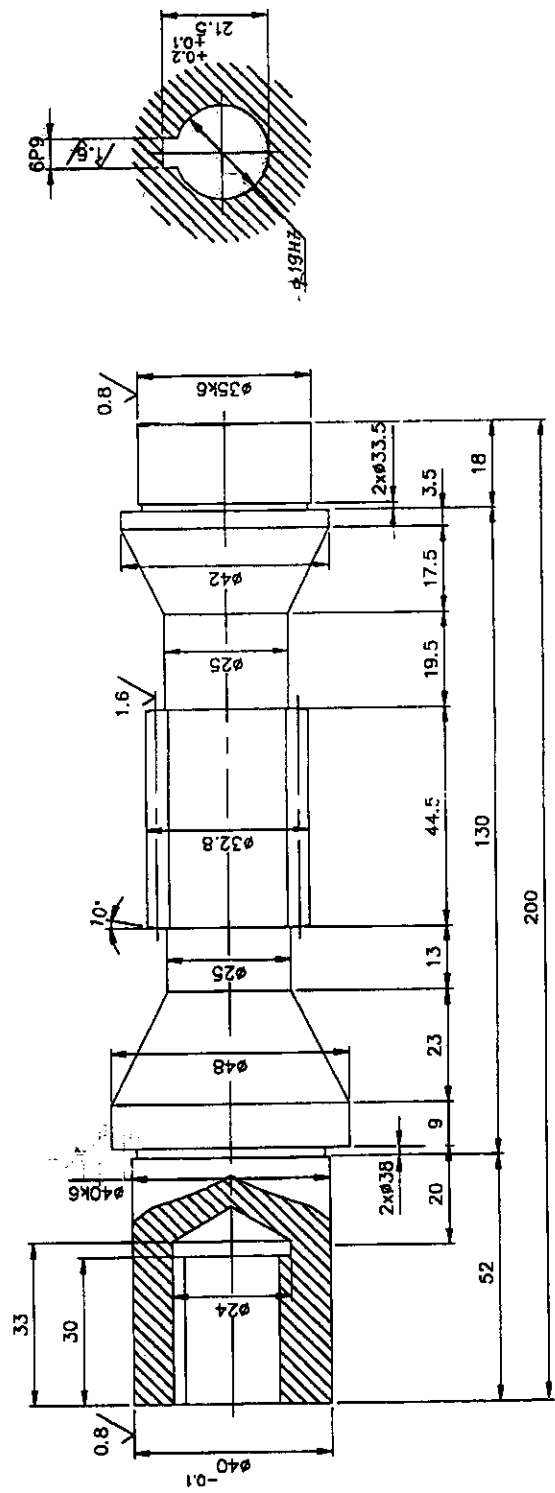
1	BASS	FG 220	IS:210	4.35	2
1	WORM WHEEL	P Cu.Sn.7	IS:28	1.00	1
	ASSY.			5.35	
	REFERENCE				
	SCALE DRAWN	P.A.ROSS			
	CHECKED	R. Rautematt			
	APPROVED				
	DATE	17-05-2002			
	1:1				
	TITLE	MACHINE HORIZONTAL BORING			
		TYPE SACENI - MEMG - 125			
		DRAWING No. 20			
		3-M-01B-11448			
		Sheet No. 20			
		REV.			

NO.OF TEETH	66
MODULE	2
PRESSURE ANGLE	20°
HELIX ANGLE	3°58'20"
HAND OF HELIX	RH
MATING WORM NO.OF STARTS	SINGLE
MATING WORM DRAWING NO.	3-M-01B-11449
CENTRE DISTANCE	80.4
CORRECTION FACTOR	-

BRACKETED DIMENSIONS FOR D.P. CUTTERS

3.2/1.5/0.8/
√/√/√/√/√

6P9	-0.012	±0.018
	-0.042	±0.002
±19H7	+0.021	±0.018
	+0.000	±0.002



NOTE: -

- 01. CHAMFER THE EDGES TO 1/45°
- 02. CONCENTRICITY AMOUNG $\phi 40K6, \phi 35k6$ - TO BE 0.010

NO. OF STARTS	SINGLE
MODULE	2
PRESSURE ANGLE	20°
AXILE PITCH	6.284
HAND OF HELIX	RH
MATING WORM NO. OF TEETH	66
MATING WORM DRAWING NO.	3-M-01B-11448
LEAD ANGLE	3°58'20"
CENTRE DISTANCE	80.4

ROD $\phi 48 \times 200L$	45CB	IS: 7283	1.5
DESCRIPTION	MATERIAL	STANDARD	NET.WT IN KGS.
REFERENCE:		COMPONENT CODE: 10	DRAWING No.
SCALE	DRAWN/TCD	ALTERATIONS:	EQUIPMENT CODE: 20
CHECKED	<i>R.P. Ramani</i>		DATE
APPROVED	<i>R.P. Ramani</i>		SIGN.
DATE	21.12.96/21.05.02		INDEX
MACHINE: HORIZONTAL BORING			
TITLE: SACEM-MEMG-125			
DRAWING No. 3-M-01B-11449			
REV. 2.0			
WORM SHAFT 1st XOD48 (TABLE MOVEMENT DRIVE)			

ALL DIMENSIONS ARE IN MM

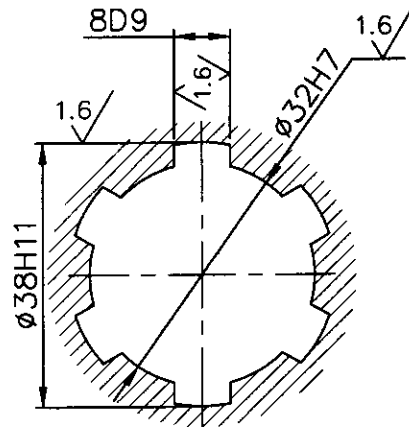
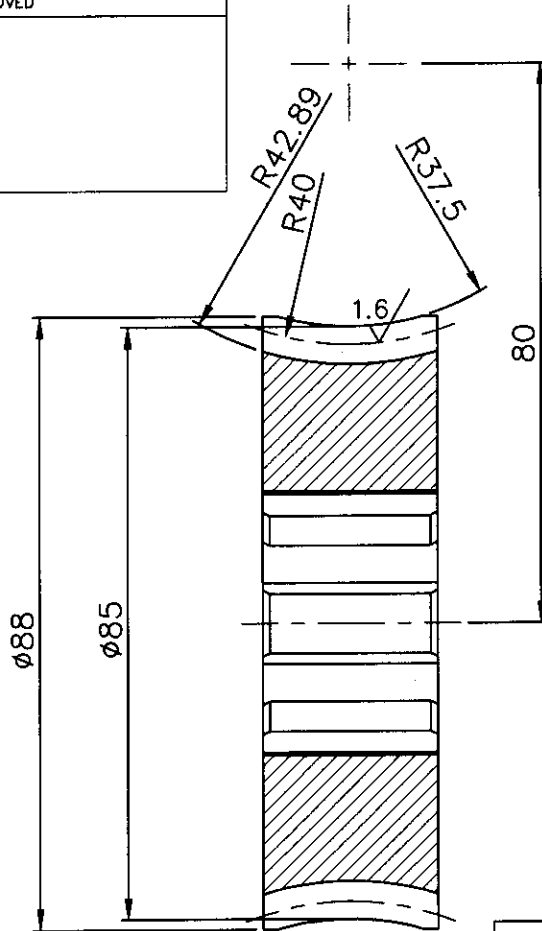
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ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		

∅32H7	+0.025
	+0.000
∅38H11	+0.160
	+0.000
8D9	+0.076
	+0.040

3.2//1.6/0.8//



CORNERS TO BE CHAMFER TO 1/45°

NO.OF TEETH	32
MODULE	2.5
PRESSURE ANGLE	20°
HELIX ANGLE	3°34'34"
HAND OF HELIX	LH
MATING WORM NO.OF STARTS	2
MATING GEAR DRAWING NO:	4M08B2429777
CENTRE DISTANCE	80

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ITEM NO	DESCRIPTION	DRAWING NO	IS 28		-
			PCuSn7		1
			MATL CODE		UNIT WT
			MATL SPEC		QTY
EQPT: CENTRE LATHE / ENTERPRISE					
Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014		DRN	NAME	SIGNATURE	DATE
		CHD	G.Govindaraj	<i>G. Govindaraj</i>	09/01/14
		APPD	K.Ramanan	<i>K. Ramanan</i>	09/01/14
DEPT	GRADE OF UNTOL. DIM	SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO	
M&S	∅/M/F			REF TO OLD DWG NO	
CODE	IS: 2102	1:1	-	ITEM	
TITLE			CARD CODE	DRAWING NO :	REV
WORM WHEEL ∅88X32T (FEED BOX)			U 01	4M08B2429776	00

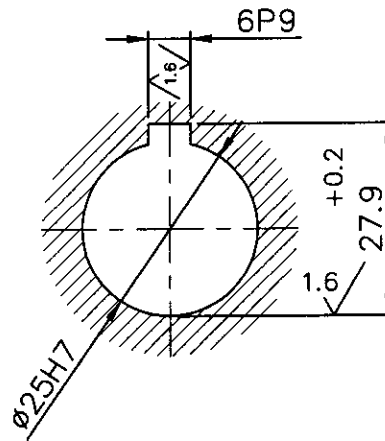
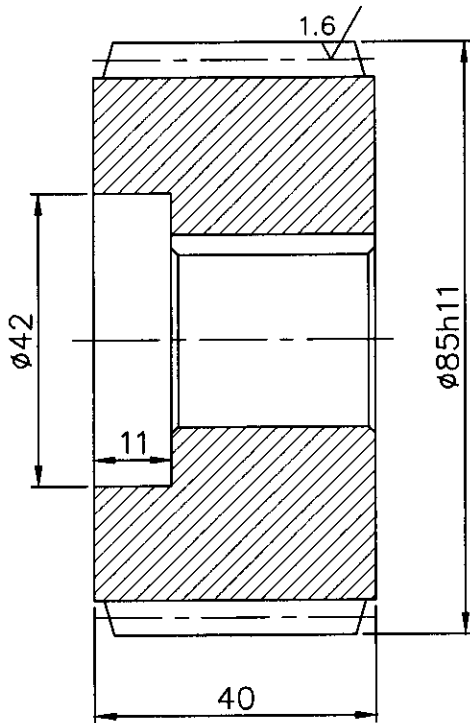
A4-SIZE

ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		

6P9	-0.012	ø25H7	+0.021
	-0.042		+0.000
		ø85h11	-0.000
			-0.220


3.2/1.6/0.8/



HARDENED TO HR_c 35±2
 CORNERS TO BE CHAMFER TO 1/45°

NO.OF STARTS	2
MODULE	2.5
PRESSURE ANGLE	20°
LEAD ANGLE	3°34'34"
AXIAL PITCH	7.855
HAND OF HELIX	LH
MATING GEAR NO.OF TEETH	32
MATING GEAR DRAWING NO:	4M08B24XXXXX
CENTRE DISTANCE	80

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ITEM NO	DESCRIPTION	DRAWING NO	IS 5517		1.42
			55C8		1
			MATL CODE		UNIT WT
			MATL SPEC		QTY
EQPT: CENTRE LATHE / ENTERPRISE					
 Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014					
DEPT	GRADE OF UNTOL. DIM	SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO	ITEM
M&S	ø/M/F			1:1	1.42
CODE	IS: 2102				
TITLE			CARD CODE	DRAWING NO :	REV
WORM SHAFT ø85X2 ST. (FEED BOX)			U 01	4M08B2429777	00

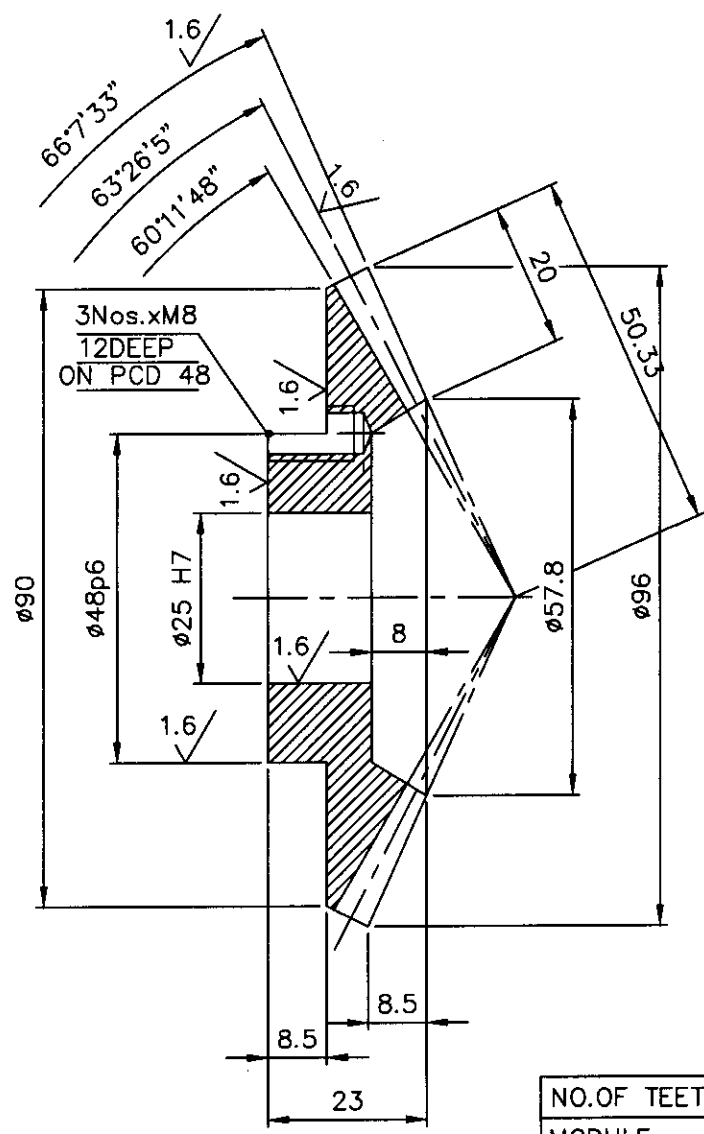
A4-SIZE

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ALL DIMENSIONS ARE IN MM

ø25H7	+0.025	ø48p6	+0.042
	+0.000		+0.026

3.2/ 1.6/



NOTE: -
CHAMFERED CORNERS FOR 1/45°
HARDENED TO HRc40±

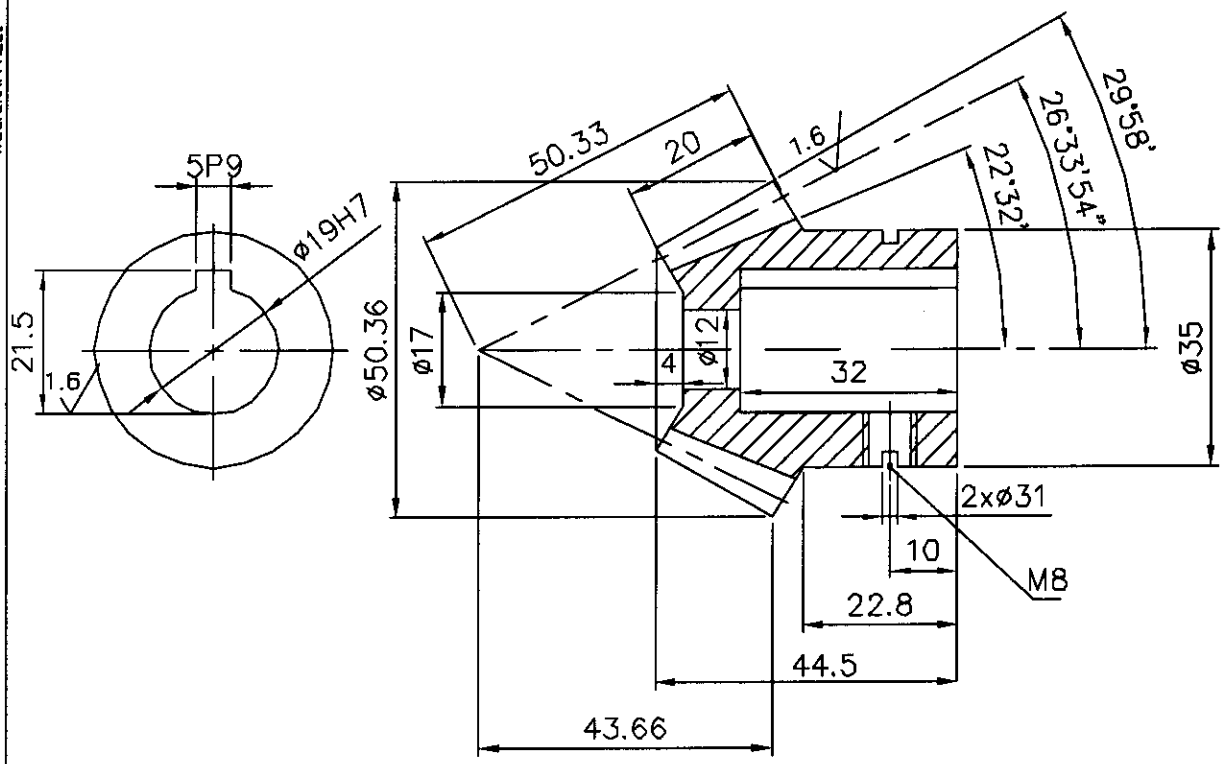
NO.OF TEETH	30
MODULE	3
PRESSURE ANGLE	20°
MATING GEAR No.OF TEETH	15
MATING GEAR DRG.No.	4M07B0828328
SHAFT ANGLE	90°

		ø96x23L	55C8	IS: 5517	1.13			
No.of Pieces	DESCRIPTION		MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.		ITEM No.
	REFERENCE:			ALTERATIONS:		DCN REF	DATE	SIGN.
SCALE	DRAWN	P.A.ROSS						
1:1	CHECKED	C.S.JAYASHEELAN						
	APPROVED	M.MANOHER						
	DATE	06-03-09						
MACHINE: HORIZONTAL LAPPING M/C			TYPE: TOA KS-85001					
	TITLE: BEVEL GEAR			DRAWING No:				
	ø96x30Tx23L			4M07B0828330				
			Sheet No:		No.of Sheets:			

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ALL DIMENSIONS ARE IN MM

5P9	-0.012	φ19H7	+0.021	3.2//1.6/0.8/ √/√/√
	-0.042		+0.000	



NO.OF TEETH	15
MODULE	3
PRESSURE ANGLE	20°
SHAFT ANGLE	90°
MATING GEAR NO.OF TEETH	30
MATING GEAR DRG.NO.:	4M07B0828330

NOTE:
 CHAMFERED CORNERS FOR 1/45°
 HARDENED TO HRc 40±

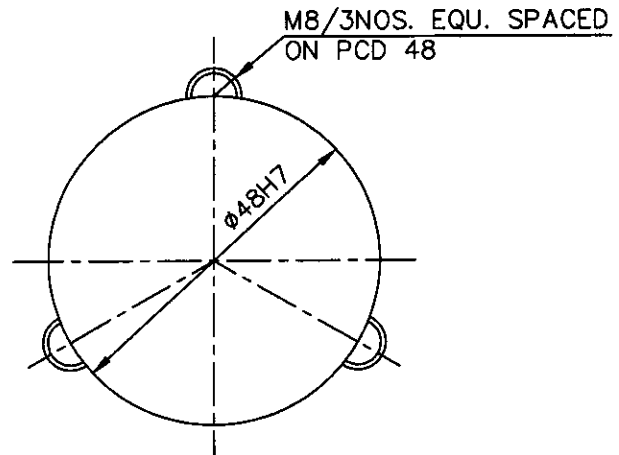
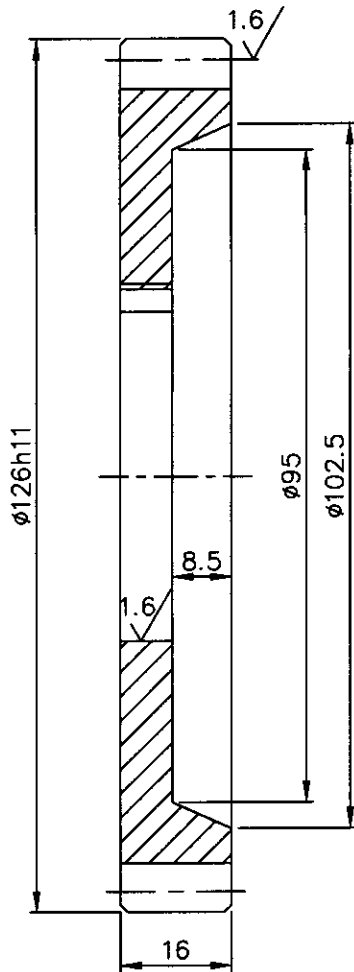
<input checked="" type="checkbox"/>	OD51x44.5L	55C8	IS: 5517	0.35		
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM NO.
	REFERENCE:	ALTERATIONS:		DCN REF	DATE	SIGN.
SCALE	DRAWN	G.G.R				
1:1	CHECKED					
	APPROVED					
	DATE	06/03/09				
	MACHINE: HOR.LAPPING	TYPE: TOA KS-85001				
	TITLE: BEVEL GEAR	DRAWING No:				REV.
	OD51x15Tx44.5L	4M07B0828328				
		Sheet No		No of Sheets:		

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ALL DIMENSIONS ARE IN MM

ø126h11	-0.000
	-0.250
ø48H7	-0.025
	-0.000

3.2/1.6/



NO. OF TEETH	40
MODULE	3
PRESSURE ANGLE	20°
WIDTH ACROSS 5 TEETH	41.5341
CORRECTION FACTOR	-
QLTY. & TOL. ZONE	9c DIN 3967
MATING GEAR NO. OF TEETH	-
MATING GEAR DRAWING NO.	-
CENTRE DISTANCE	-

NOTE: -

SHARP CORNERS TO BE CHAMFERD 1/45°

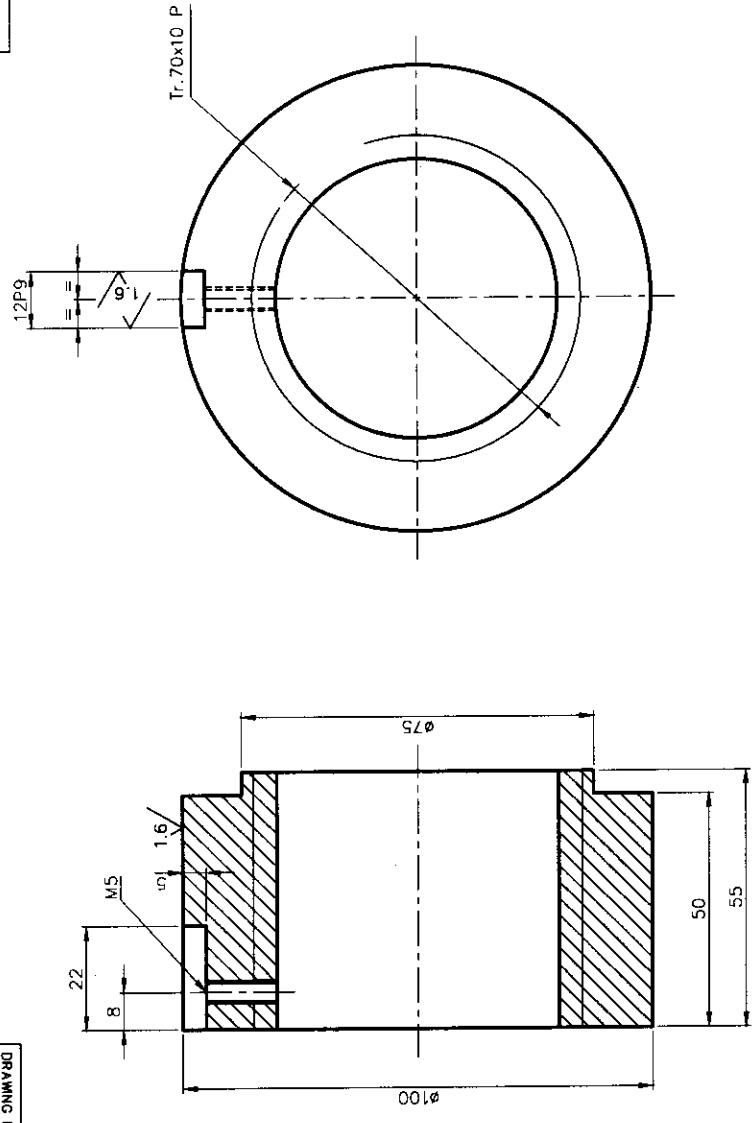
<input checked="" type="checkbox"/>	ø126x16L	45C8	IS: 2004	1.56		
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE:	ALTERATIONS:		DCN REF	DATE	SIGN.
SCALE	DRAWN	N. MANOJ				
1:1	CHECKED	R. RAMAMOORTHY				
	APPROVED	C.S. JAYASHEELAN				
	DATE	06/03/09				
	MACHINE:	HORIZONTAL LAPPING		TYPE: TOA KS-85001		
	TITLE:	SPUR GEAR (ø126x40T)		DRAWING No:		REV.
				4M07B0828329		
			Sheet No:		No. of Sheets:	

ALL DIMENSIONS ARE IN MILLIMETRES

ø12 P9
-0.018
-0.061

3.2/1.6/1

DRAWING NO: 3M01A1115212



NOTE:
SHARP CORNERS TO BE REMOVED
MATING SCREW ROD REFER DRG.NO.2M01A1105120
MATING BOX NUT REFER DRG.NO.3M01A1115210

ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	IS: 2004	1.73
	ø100x55 L		45C8		1
EQUIPMENT: DOUBLE COLUMN VERTICAL BORING/SKS 25 CNC					
Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TRUCHIRAPALLI - 620014		DRN	NAME	SIGNATURE	DATE
		CHD	S.SELVAMANCKAM	<i>S. Selvamankam</i>	26.12.13
		APPD	G.GOVINDARAJ	<i>G. Govindaraj</i>	03.01.14
			K.RAMANAN	<i>K. Ramanan</i>	
DEPT	GRADE OF UNITS (DW)	SCALE	WEIGHT (KG)	REF TO ASSY DWG NO	ITEM
M/S	15-2102	1:1	1.73	2M01A1105120	
CODE	2587			REF TO OLD DWG NO	
TITLE		DRAWING NO :			
SAFETY NUT 70Tr.x10Px55 L (RAIL UP&DOWN SCREW ROD ASSY)		3M01A1115212			
REV	DATE	ALTERED	CHECKED	APPROVED	ZONE
CAUTION: THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.					

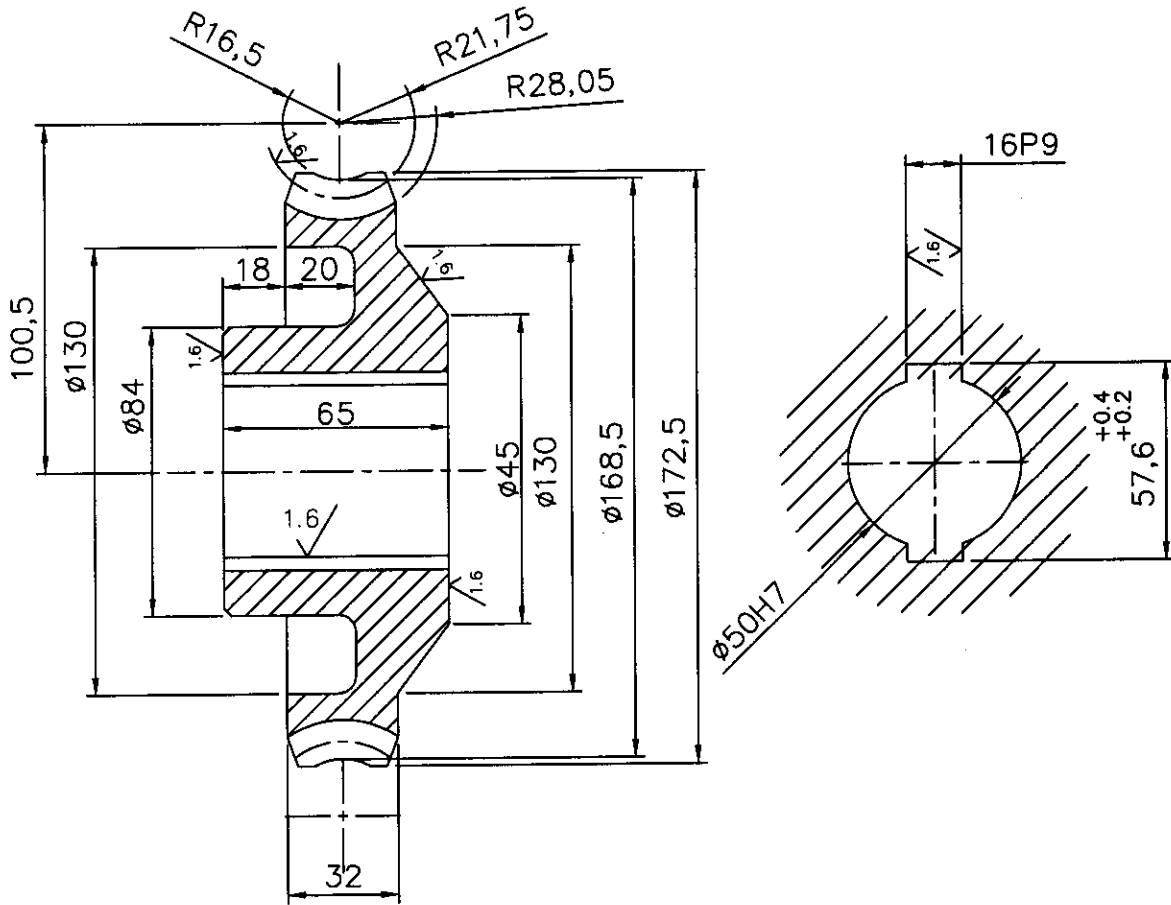
A3-SIZE

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ALL DIMENSIONS ARE IN MM

ø50H7	+0.030	16P9	-0.018
	+0.000		-0.061

3.2//1.6//



NO.OF TEETH	30
MODULE	5.25
PRESSURE ANGLE	20°
HELIX ANGLE	6°52'54"
HAND OF HELIX	RH
MATING GEAR NO.OF START	SINGLE
MATING GEAR DRAWING NO:	3M10B4815115
CENTRE DISTANCE	100.5

NOTE: -

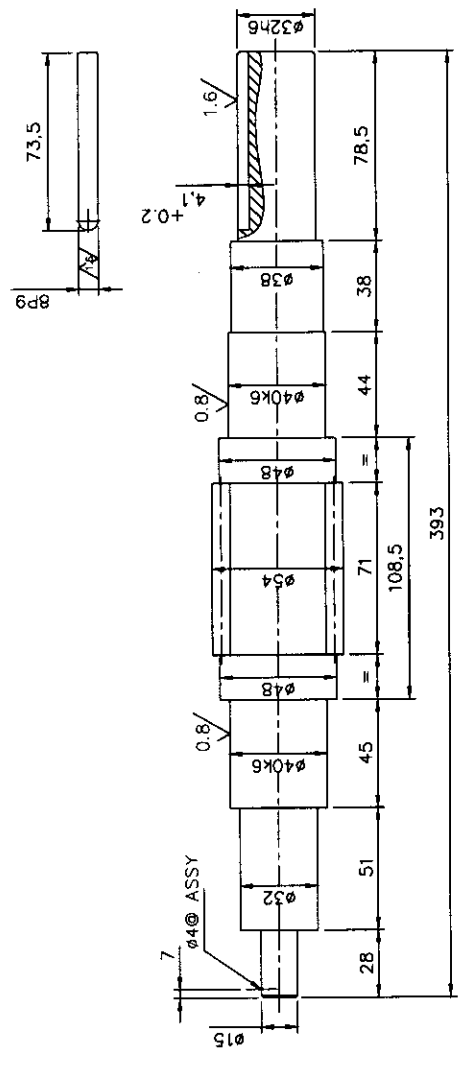
CHAMFER CORNERS FOR 1/45°

No. of Pieces	ø172.5x65L		PCu Sn7	IS: 28	5.60	DRAWING No.		ITEM No.				
	DESCRIPTION		MATERIAL	STANDARD	NET.WT.IN KGS.	ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX		
SCALE 1:2	DRN.	T.T.BALAKRISHNAN	T.T. Balakrishnan									
	CHD.	R.RAMAMOORTHY										
	APPD.	K.RAMANAN										
	DATE	31.05.2013										
	MACHINE: WELDING POSITIONER				TYPE: ADVANI ORLEKON-2T(BLDG-6)							
	TITLE:				DRAWING No:							
	WORM WHEEL 30txø172.5 (TABLE ROTATING ASSY)				4M10B4829692		Sheet No:				No. of Sheets:	

ALL DIMENSIONS ARE IN MM

3.2/1.6/0.8/

±0.018	±0.002	±0.018	±0.002	±0.018	±0.002
0.015	0.005	0.015	0.005	0.015	0.005
0.015	0.005	0.015	0.005	0.015	0.005



NOTE: - SHARP CORNER TO BE REMOVED

NO. OF STARTS	SINGLE
MODULE	5.25
PRESSURE ANGLE	20°
LEAD ANGLE	6°52' 54"
HAND OF HELIX	RH
AXIAL PITCH	16.49
MATING GEAR NO. OF TEETH	30
MATING GEAR DRAWING NO.	4M10B4829692
CENTRE DISTANCE	100.5

DESCRIPTION	45C8	IS: 2004	NET.WT. IN KGS.	7.06
MATERIAL				
ALTERATIONS:	DCN	REF	DATE	SKN.
REFERENCE:				
DRN.	T. BALAKRISHNAN	DATE	31.05.2013	
CHD.	R. RAMAMOORTHY			
APPD.	K. RAMANAN			
DATE	31.05.2013			
MACHINE:	WELDING POSITIONER			
TYPE:	ADVANI ORLEKON-21(BLDG-6)			
TITLE:	WORM SHAFT SINGLE STARTS (TABLE ROTATING ASSY)			
DRAWING No:	3M10B48151115			
Sheet No:				
No. of Sheets:				

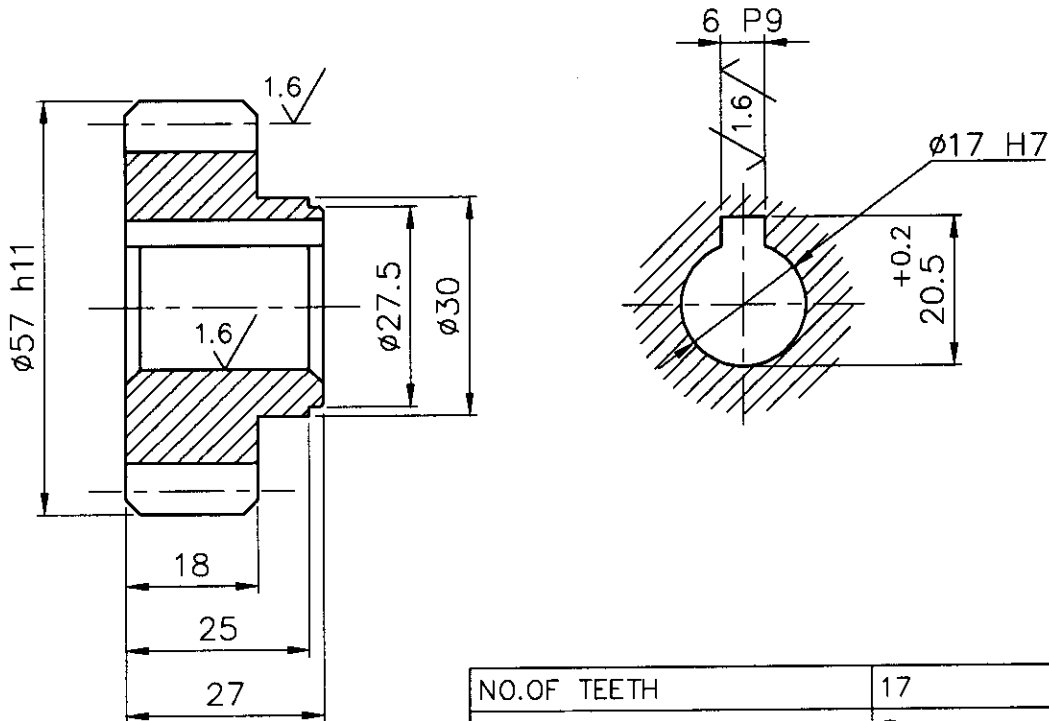
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ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		

ø57 h11	-0.000	ø17 H7	+0.018
	-0.190		0.000
6 P9			-0.012
			-0.042

3.2 // 1.6 //



NO.OF TEETH	17
MODULE	3
PRESSURE ANGLE	20°
WITH ACROSS 3 TEETH	22.82 ^{-0.141} _{-0.188}
CORRECTION FACTOR	NIL
QLTY.&TOL.ZONE	9C DIN 3967
MATING GEAR NO.OF TEETH	49&17
MATING GEAR DRAWING NO:	4M07B1429797
CENTRE DISTANCE	-

NOTE:
 HARDENED TO HRc.35 ±2
 SHARP CORNERS TO BE REMOVED

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1	ø57x27 t		IS 5517	0.67
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
			MATL SPEC	QTY

EQPT: VALVE BODY SEATLAPPING 4 TONRD /4T SG 2GA

	Bharat Heavy Electricals Ltd		DRN	S.SELVAMANICKAM	SIGNATURE	S. Selvamaniakam	DATE	15.04.14
	HIGH PRESSURE BOILER PLANT		CHD	G.GOVINDARAJ	SIGNATURE	G. Govindaraj	DATE	16.04.14
	TIRUCHIRAPALLI - 620014		APPD	K.RAMANAN	SIGNATURE	K. Ramanan	DATE	17.04.14

DEPT	GRADE OF UNTO. DIM		SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO	ITEM
M&S	ø/M/AF		1:1	0.21	REF TO OLD DWG NO	
CODE	IS: 2102					

TITLE	CARD CODE	DRAWING NO :	REV
SPUR GEAR 17Txø57 (LAPPING ASSY.)	U 01	4M07B1429793	00

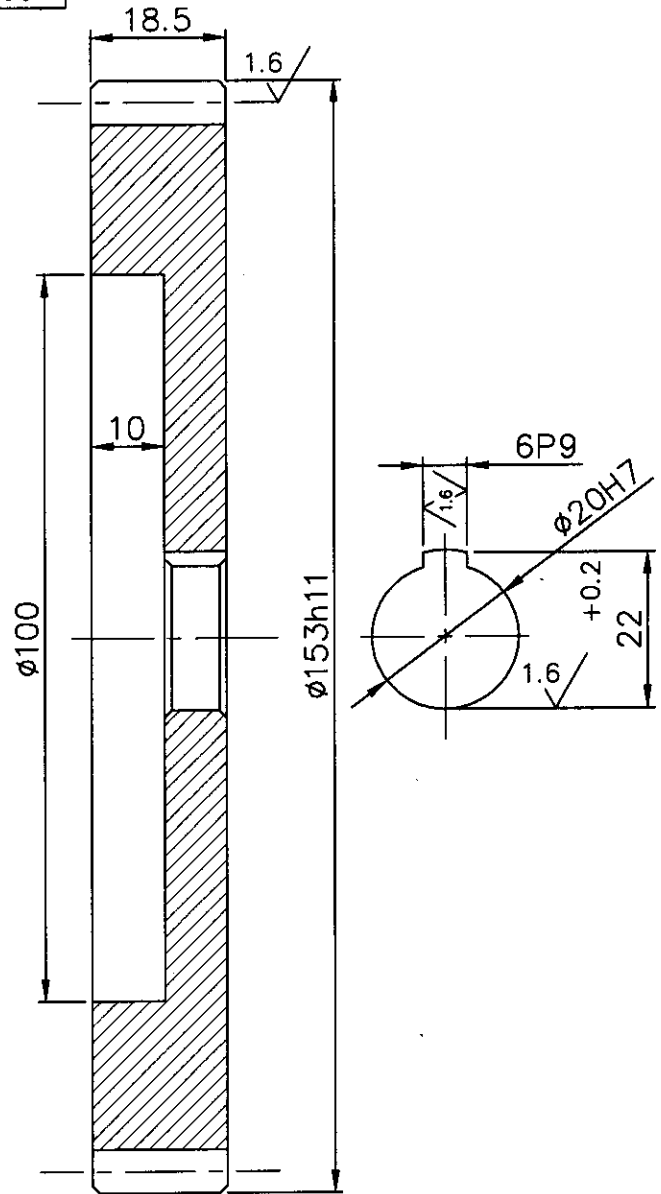
ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		

6P9	-0.012	ø20H7	+0.021
	-0.042		+0.000
ø153h11	-0.000		
	-0.250		


3.2/1.6/

NO.OF TEETH	49
MODULE	3
PRESSURE ANGLE	20°
WIDTH A/C. 7 TEETH	50.76 -0.141 -0.188
QLTY.&TOL.ZONE	9C DIN 3967
CORRECTION FACTOR	NIL
MATING GEAR NO.OF TEETH	17
MATING GEAR DRAWING NO:	4M07B1429793
CENTRE DISTANCE	-



NOTE: -
HARDENED TO HRc 35 ±2
CORNERS TO BE CHAMFER TO 1/45°

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ITEM NO		DESCRIPTION		DRAWING NO		IS 5517		2.03			
		ø153x18.5L				55C8		1			
						MATL CODE		UNIT WT			
						MATL SPEC		QTY			
EQPT: VALVE BODY SEAT LAPPING M/C. / 4T.SG-2GA											
 Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014				NAME		SIGNATURE		DATE			
				DRN		S.Selvamanickam		S.Selvamanickam		22/04/14	
				CHD		G.Govindaraj		G.Govindaraj		22/04/14	
APPD		K.Ramanan		K.Ramanan		22/04/14					
DEPT		GRADE OF UNTOL. DIM		SCALE		WEIGHT (Kg)		REF TO ASSY DWG NO			
M&S		ø/M/F		1:1		2.03		REF TO OLD DWG NO			
CODE		IS: 2102						ITEM			
2597											
TITLE					CARD CODE		DRAWING NO :		REV		
SPUR GEAR 49Txø153					U 01		4M07B1429797		00		
(LAPPING ASSY.)											

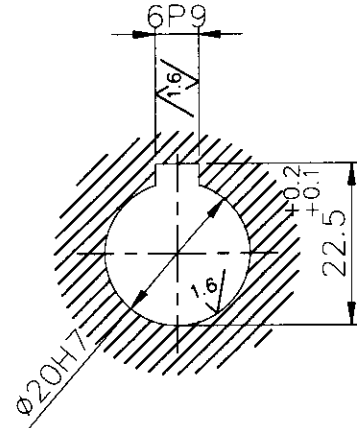
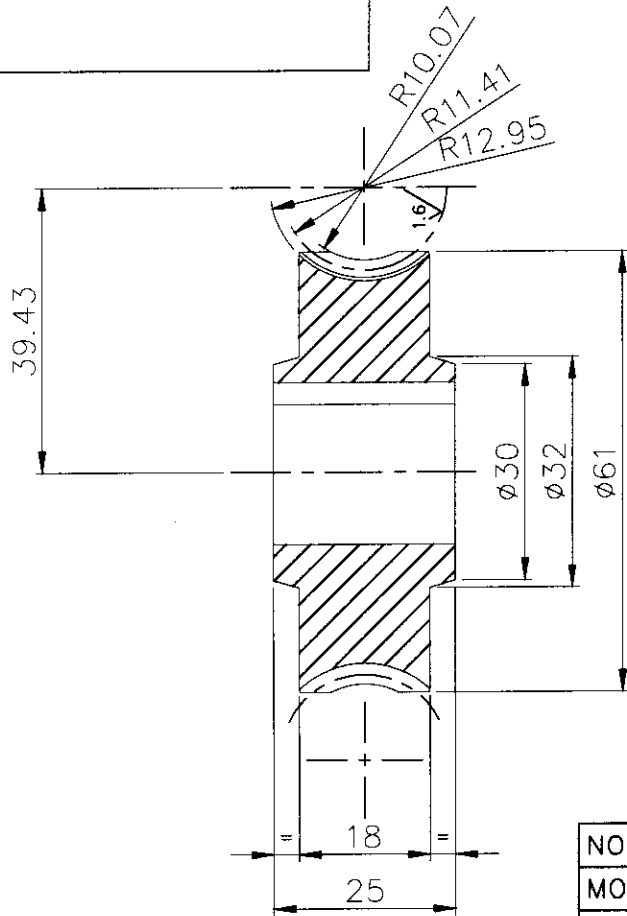
A4-SIZE

ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		

∅20H7	+0.021	6P9	-0.012
	+0.000		-0.042

3.2 // 1.6 //



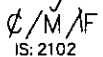


NO.OF TEETH	42
MODULE	1.3348(19DP)
PRESSURE ANGLE	20°
HELIX ANGLE	3° 21'33"
HAND OF HELIX	RH
AXIAL PITCH	4.199
MATING GEAR DRAWING NO:	4-M-08F11-29824
CENTRE DISTANCE	39.43

NOTE: -

CHAMFER CORNERS FOR 1/45°

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∅61x25L		IS 28		0.38
PCu Sn7		1		
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
			MATL SPEC	QTY
EQPT: CNC LATHE / MAXMULLER-MDW20				
 Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014	DRN	T.T.BALAKRISHNAN	SIGNATURE <i>T.T. Balakrishnan</i>	DATE 26.09.14
	CHD	R.RAMAMOORTHY	<i>R. Ramamoorthy</i>	27.09.14
	APPD	G.THIAGARAJAN	<i>G. Thiagarajan</i>	27.09.14
DEPT M&S	GRADE OF UNTOL. DIM	 SCALE 1:1	WEIGHT (Kg)	
CODE 2597	 IS: 2102		0.38	
TITLE		CARD CODE	REF TO ASSY DWG NO	ITEM
WORM WHEEL 42tx∅61		U 01	REF TO OLD DWG NO	
(SHIP CONVEYOR GEAR BOX ASSY)			DRAWING NO :	REV
			4-M-08F11-29823	00

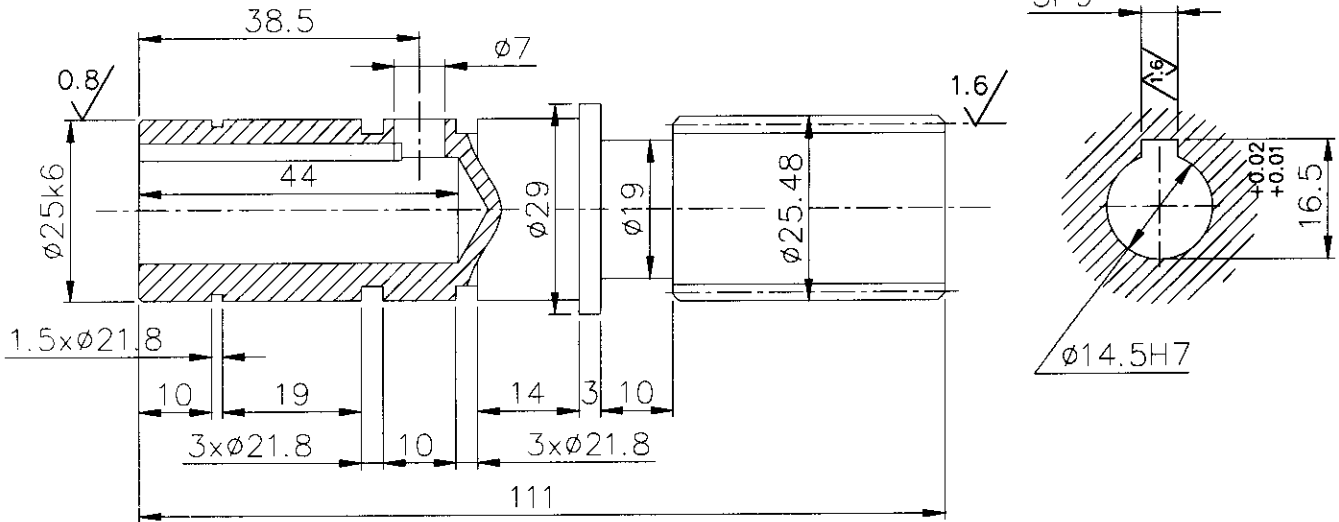
A4-SIZE

ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		

ø25k6	+0.021	5P9	-0.012
	+0.000		-0.042
ø14.5H7	+0.018		
	+0.000		

3.2 // 1.6 // 0.8 //



NO.OF STARTS	SINGLE
MODULE	1.3348(19DP)
PRESSURE ANGLE	20°
LEAD ANGLE	3° 21'33"
HAND OF HELIX	RH
AXIAL PITCH	4.199
MATING GEAR DRAWING NO:	4-M-08F11-29823
CENTRE DISTANCE	39.43

NOTE: -
CHAMFER CORNERS FOR 1/45°

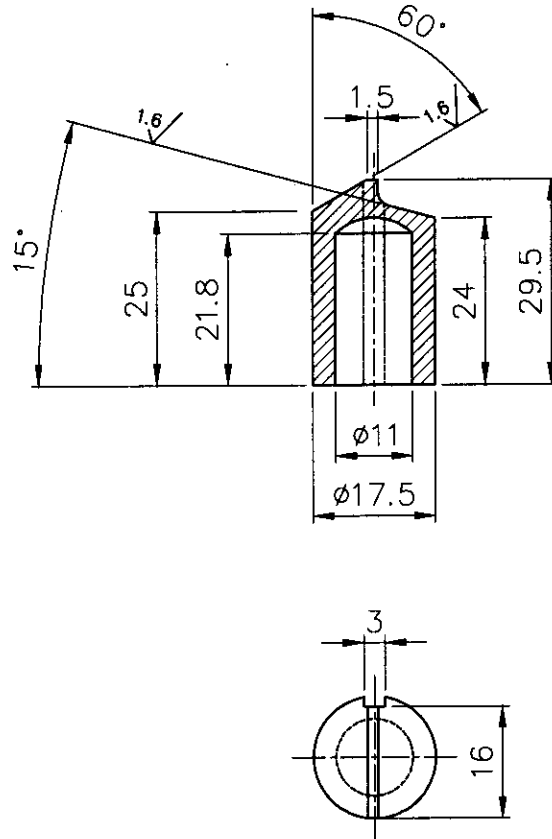
CAUTION: THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.	ø30x111L		IS 2004		0.41	
			45C8		1	
	ITEM NO	DESCRIPTION	DRAWING NO		MATL CODE	UNIT WT
					MATL SPEC	QTY
EQPT: CNC LATHE / MAXMULLER-MDW20						
Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014		DRN	T.T.BALAKRISHNAN	SIGNATURE	DATE	
		CHD	R.RAMAMOORTHY	<i>R. Ramamoorthy</i>	27.09.14	
		APPD	G.THIGARAJAN	<i>G. Thiagarajan</i>	27.09.14	
DEPT	GRADE OF UNTOL. DIM	SCALE 1:1	WEIGHT (Kg)	REF TO ASSY DWG NO	ITEM	
M&S	ø/M/AF		0.41	REF TO OLD DWG NO		
CODE	IS: 2102					
TITLE			CARD CODE	DRAWING NO :	REV	
WORM SHAFT ø29x111 (SHIP CONVEYOR GEAR BOX ASSY)			U 01	4-M-08F11-29824	00	

A4-SIZE

ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		

3.2/1.6/



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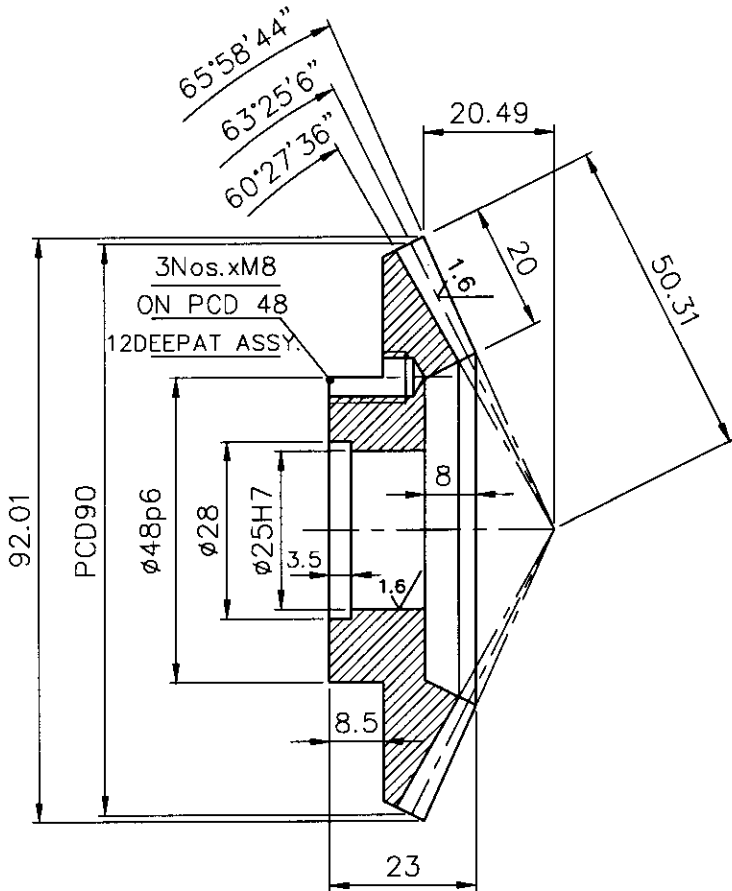
ITEM NO	DESCRIPTION	DRAWING NO	IS 2004		-
			45C8	1	
M&S CODE	GRADE OF UNTOL DIM	SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO	
				REF TO OLD DWG NO	
EQPT: TURRET LATHE / HERBERT-9C/30			Bharat Heavy Electricals Ltd		
HIGH PRESSURE BOILER PLANT			DRN	G.Govindaraj	S. Govindaraj
TIRUCHIRAPALLI - 620014			CHD	R.Ramamoorthy	R. Ramamoorthy
			APPD	G.Thiagarajan	S. Thiagarajan
IS: 2102			DATE		05/07/14
IS: 2102			DATE		15/07/14
IS: 2102			DATE		21/07/14
TITLE			DRAWING NO :		REV
PLUNGER Ø17.5X30L			4-M-08D08-29812		00
(LAPPING ASSY.)			U 01		

A4-SIZE

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ALL DIMENSIONS ARE IN MM

48p6	+0.042 +0.026	ø25H7	+0.025 +0.000	3.2//1.6/0.8 √/√/√
------	------------------	-------	------------------	-----------------------



NO.OF TEETH	40
MODULE	2.25
PRESSURE ANGLE	20°
SHAFT ANGLE	90°
MATING GEAR NO.OF TEETH	20
MATING GEAR DRG.NO.:	4M07B0828429

NOTE:

CHAMFERED CORNERS FOR 1/45°

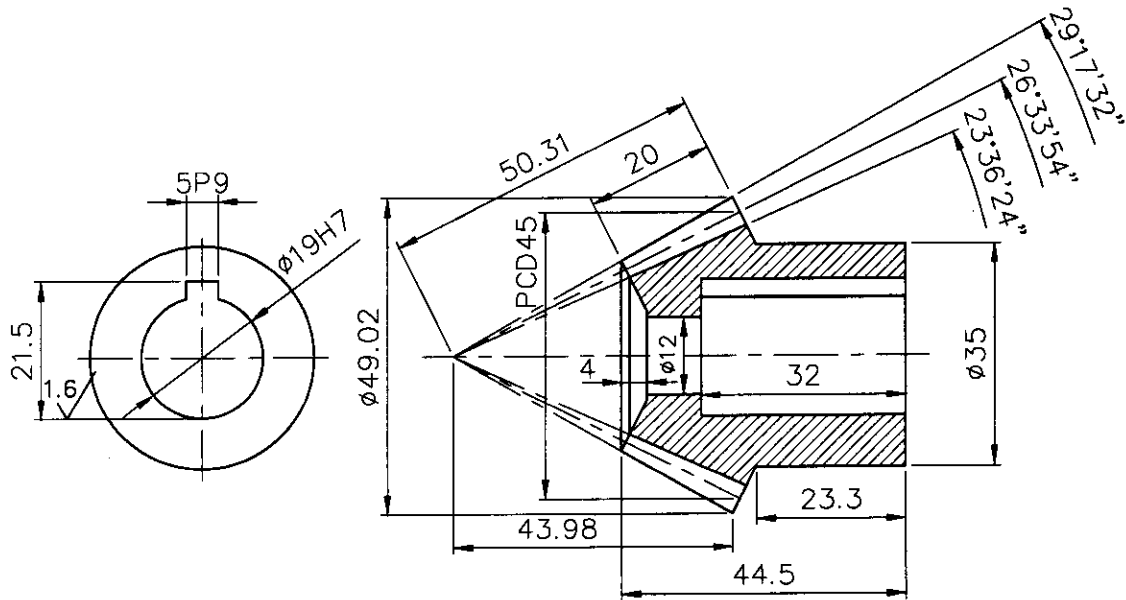
HARDENED TO HRC 35±

OD92x23L		55C8	IS: 5517	1.13		
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE:		ALTERATIONS:	DCN REF	DATE	SIGN.
SCALE	DRAWN	G.G.R				
1:1	CHECKED	R.RAMAMOORTHY				
	APPROVED	C.S.JAYASHEELAN				
	DATE	06/03/09				
MACHINE: HOR.LAPPING			TYPE: TOA KS-85001			
TITLE: BEVEL GEAR			DRAWING No:			REV.
OD92x40Tx23L			4M07B0828428			
			Sheet No:			No. of Sheets:

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ALL DIMENSIONS ARE IN MM

5P9	-0.012	Ø19H7	+0.021	3.2//1.6/0.8/
	-0.042		+0.000	



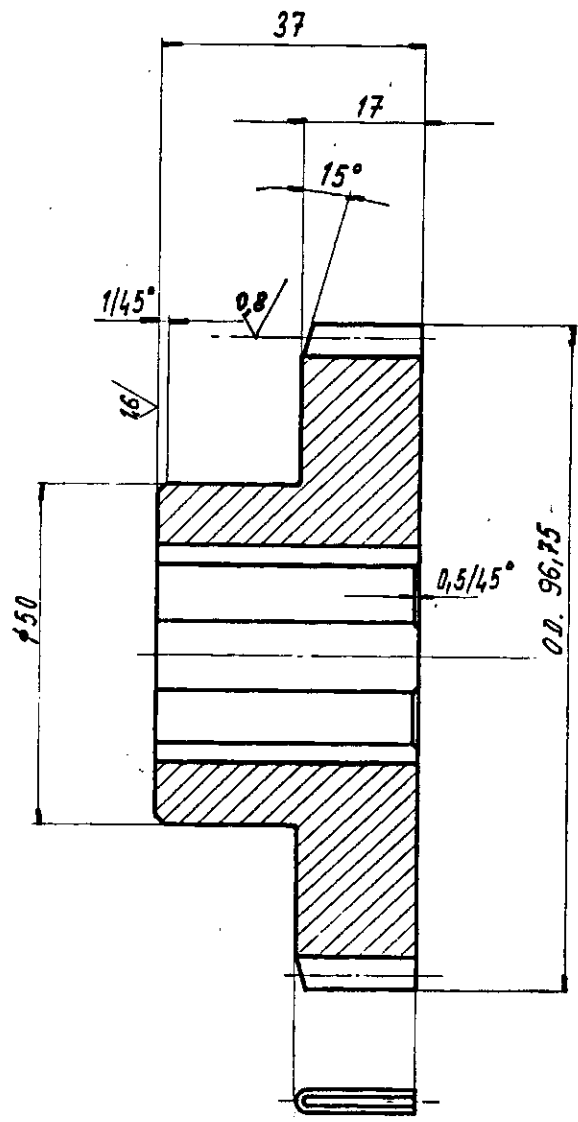
NO.OF TEETH	20
MODULE	2.25
PRESSURE ANGLE	20°
SHAFT ANGLE	90°
MATING GEAR NO.OF TEETH	40
MATING GEAR DRG.NO.:	4M07B0828428

NOTE:

CHAMFERED CORNERS FOR 1/45°

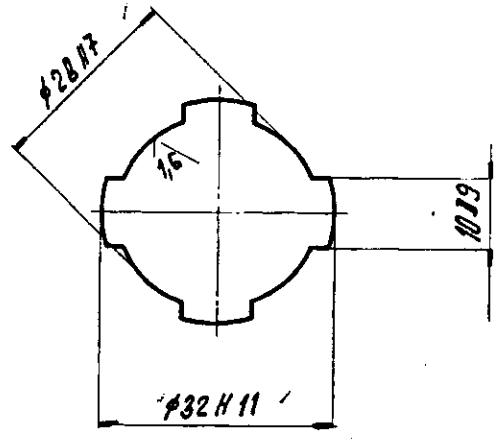
HARDENED TO HRC 35±

OD49x44.5L		55C8	IS: 5517	0.35			
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.	
	REFERENCE:		ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX
SCALE	DRAWN	G.G.R					
1:1	CHECKED	R.RAMAMOORTHY					
	APPROVED	C.S.JAYASHELAN					
	DATE	06/03/09					
MACHINE: HOR.LAPPING			TYPE: TOA KS-85001				
TITLE: BEVEL GEAR			DRAWING No:		REV.		
OD49x20Tx44.5L			4M07B0828429				
			Sheet No:		No. of Sheets:		



0.2 / 0.16 / 0.8 /

φ32 H11	+0.000
	+0.160
φ28 H7	+0.000
	+0.021
10 H9	+0.040
	+0.076



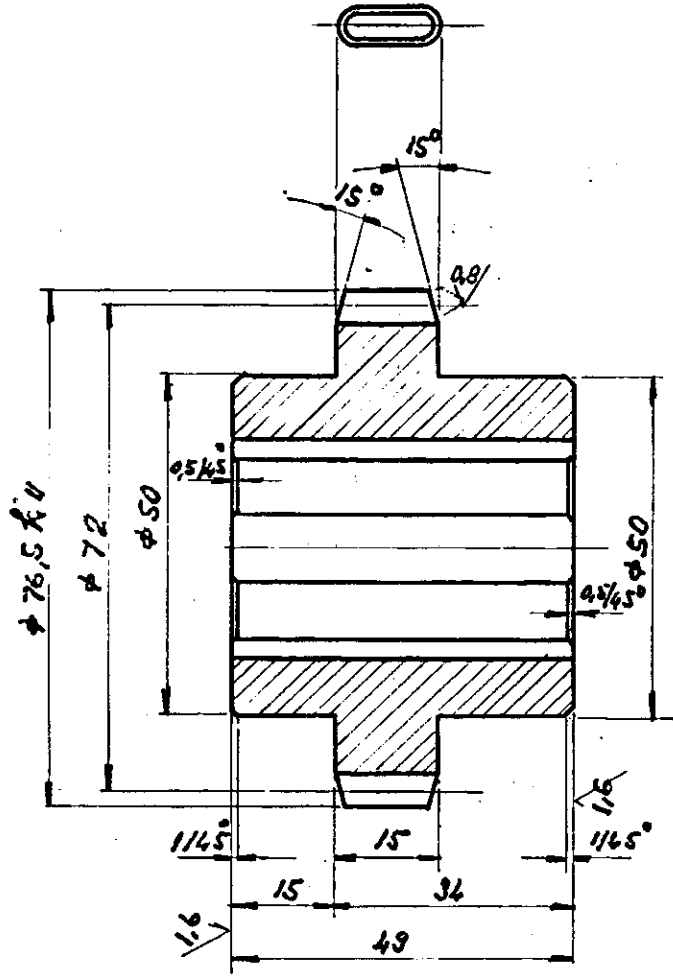
NO OF TEETH 41
 MODULE 2.25
 PRESSURE ANGLE 20°
 CORRECTION FACTOR —
 RIGIDITY, TOLERANCE ZONE 9C-DIN-3967
 WIDTH ACROSS TEETH ST: 31.182-0A41
 0.188
 I NO OF TEETH ON MATING GEAR : 42
 CENTRE DISTANCE : 93.375
 MATING GEAR DRG NO: 4-M-08a-1959
 II NO OF TEETH ON MATING GEAR : 21
 CENTRE DISTANCE : 71.25
 MATING GEAR DRG. NO. : 4-M-08a-1962.

NOTE:-
HEAT TREAT TO HRC 28

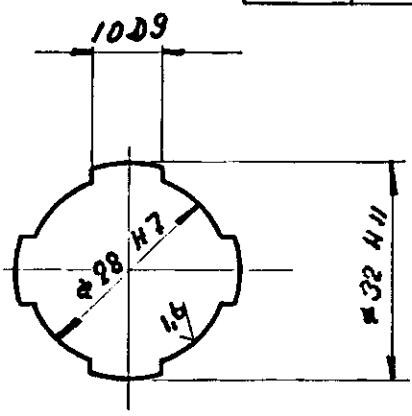
		C 55 Mn 25		45 CB		1.1X		0.1.08a.0098 27		
		IS: 5517		IS: 5517						
NO. OF PIECES	DESCRIPTION	SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	ITEM NO.	
REMARKS				TOTAL NET wt (kg) 22.08 EC 01						
SCALE 1:1	DRAWN	REFERENCE	ALTERATIONS							
	CHECKED		DATE	SIGNATURE	ALTERATION INDEX					
	APPROVED									
	STDS. OFFICER									
DATE		17-9-67								
MACHINE: H.M.T CENTRE LATHE			TYPE: LB 17, 20 & 25 INV. NO.							
TITLE: SPUR GEAR φ96.75 x 41			DRAWING NO: 4-M-08a-1834 ⁰¹							
II SHAFT. (SPEED 800) LB. 17-30-224			NO. OF SHEETS				SHEET NO:			



32/46 08/



10 D9	+0,040
	+0,076
φ28 H7	+0,000
	+0,021
φ32 H11	+0,000
	+0,160
φ76,5 H11	-0,000
	-0,130



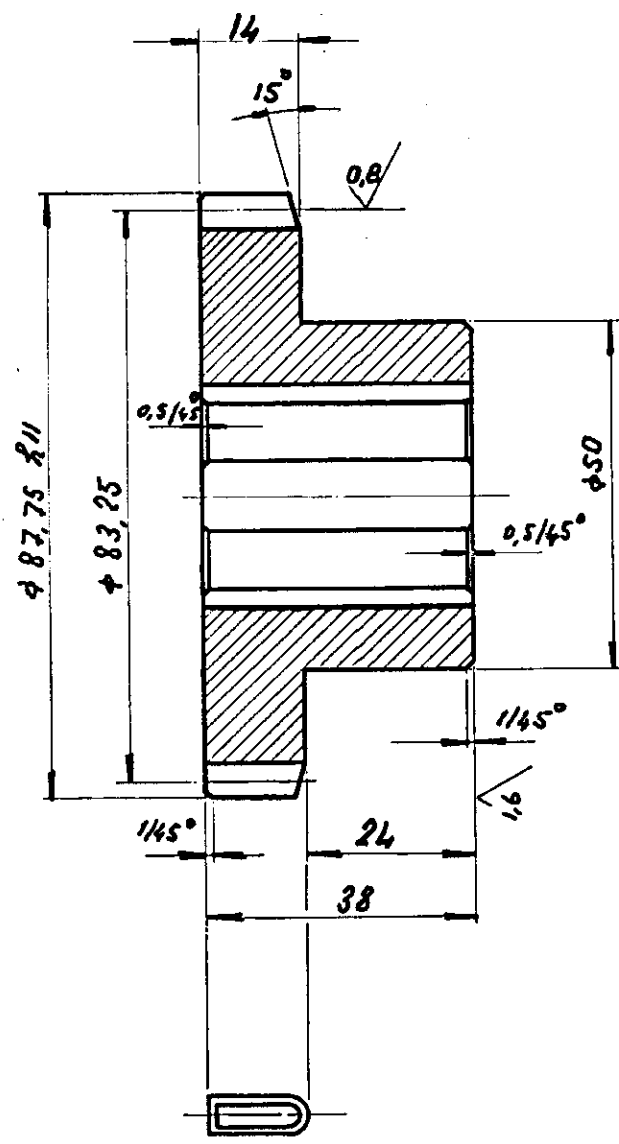
NO. OF TEETH 32
 MODULE 2,25
 PRESSURE ANGLE 20°
 QUALITY TOL. ZONE - 9c-DIN 3967
 WIDTH ACROSS TEETH 47/24,2563^{-0,14}_{-0,188}
 I MATING GEAR DRG. NO. 4-M-082-1961
 MATING GEAR NO. OF TEETH - 31
 CENTRE DISTANCE : 71.25
 II MATING GEAR DRG. NO. 4-M-082-1957
 NO. OF TEETH ON MATING GEAR : 51
 CENTRE DISTANCE : 93.375

HEAT TREAT TO HRe-28.

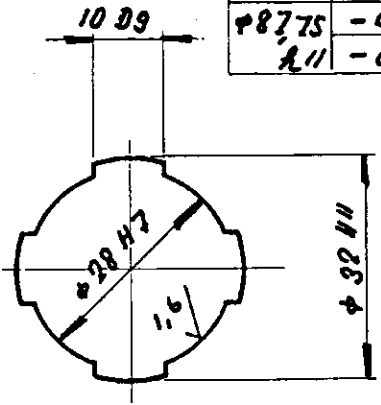
1			AM-C.55	55 CB IS:5517		0.603	0-M.082-058	25	
NO. OF PIECES	DESCRIPTION	SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET WT (kg) CC:08 EC:01 C:					
SCALE	DRAWN	REFERENCE		ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX		
	CHECKED								
	APPROVED								
	BYDS. OFFICER								
DATE		8.5.62							
MACHINE: H.M.T CENTRE LATHE				TYPE: LB 17,20 & 25 INV. NO.					
TITLE: SPUR GEAR φ76,5 x 32 (SPEED BOX) LB-17-30-329				DRAWING NO: 4-M-082 ⁰¹ -1835					
NO. OF SHEETS				SHEET NO:					



3.2 / 1.5 / 0.8



10D9	+0,040
	+0,076
±28 H7	+0,000
	+0,021
±32 H11	+0,000
	+0,160
±87,75	-0,000
H11	-0,220



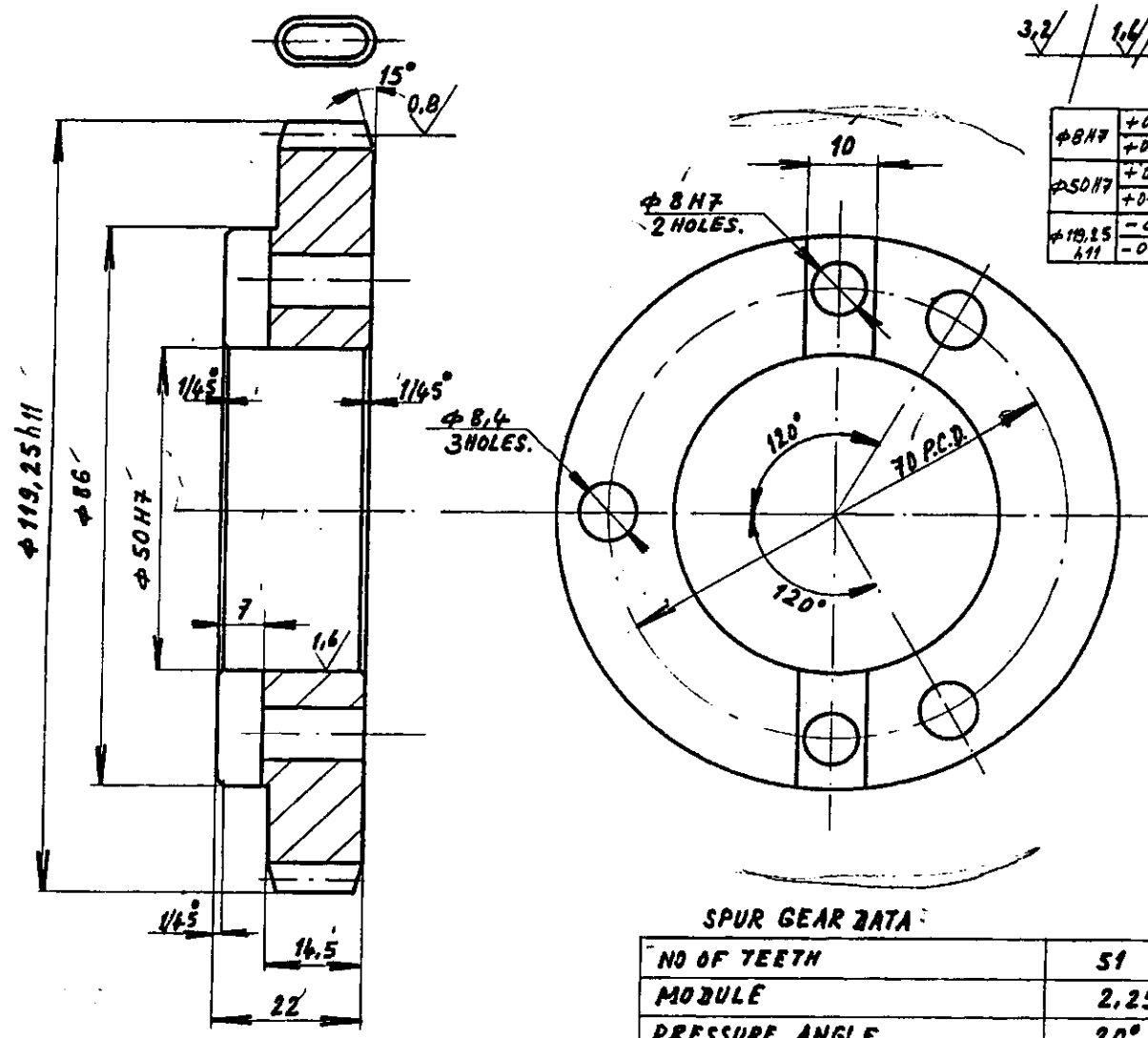
No. OF TEETH 37
 MODULE 2,25
 PRESSURE ANGLE 20°
 QUALITY, TOLERANCE ZONE 9c DIN 3967
 WIDTH ACROSS TEETH 57/31,056 -0,188
 MATING GEAR DRG. No. 4-M-08a-1958
 MATING GEAR No. OF TEETH - 45
 CENTRE DISTANCE : 93.375

NOTE:-
HEAT TREAT TO HRC 28

1			C.55 Mn 75 IS: 5517	55CB IS: 5517	1.01			O.M. 08a-09226	
NO. OF PIECES	DESCRIPTION	SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET WT (kg) CC: 08		EC: 01			
SCALE	DRAWN	REFERENCE	ALTERATIONS		DATE	SIGNATURE	ALTERATION INDEX		
1:1	Checked Approved STDS. OFFICER DATE	M. Anand S. S. S. S. S. S. S. S. 8.9.67							
MACHINE: N.M.7 CENTRE LATHE			TYPE: LB 1720625		INV. NO.				
TITLE: SPUR GEAR φ 87,75x37			DRAWING NO: 4-M-082-1836		01				
(SPEED BOX) LB 17-30-322			NO. OF SHEETS		SHEET NO:				



3.2 / 1.6/0.9



NOTE:-
HEAT TREAT TO HRC 28

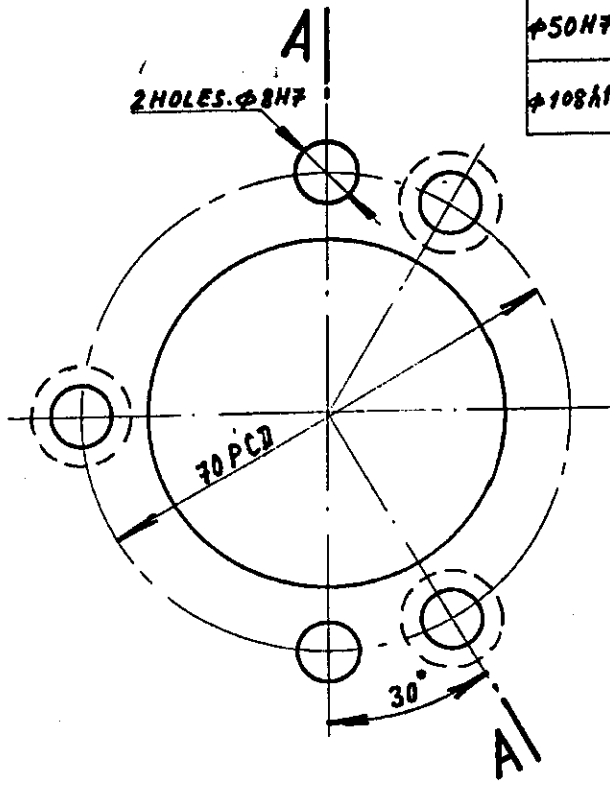
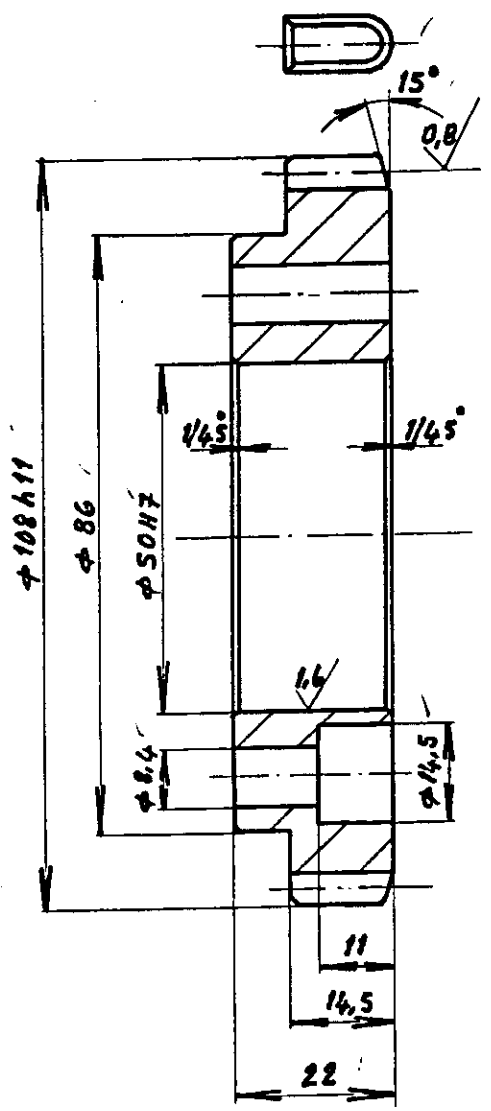
SPUR GEAR DATA

NO OF TEETH	51
MODULE	2.25
PRESSURE ANGLE	20°
QUALITY, TOLERANCE ZONE	9C-DIN-3967
WIDTH ACROSS TEETH. GT.	38.14 -0.158
MATING GEAR DRG. NO.	4-M-08a-1835
NO. OF TEETH ON MATING GEAR	327
CENTRE DISTANCE	93.375

NO. OF PIECES		DESCRIPTION		SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	ITEM NO.
					C55 Mn 25 IS:5517	-55CB IS:5517		1.65		0-M-08a-0088	20
REMARKS						TOTAL NET wt (kg) EC:01 CC:08					
SCALE	DRAWN	REFERENCE			ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX			
1:1	CHECKED										
	APPROVED										
	STDS. OFFICER										
	DATE	4-10-1967.									
MACHINE: H.M.T. CENTRE LATHE					TYPE: LB 20, 17 & 25 INV. NO.						
TITLE: LB 17-30-326					DRAWING NO: 02						
SPUR GEAR 51T x φ 119.25					4-M-08a-1957						
[SPEED BOX] III SHAFT					NO. OF SHEETS SHEET NO:						



3.2 / 1.6/08/



Ø 50H7	+0.0
	+0.025
Ø 108H11	-0.0
	-0.22

NOTE:-
HEAT TREAT TO HRC 28

SPUR GEAR DATA

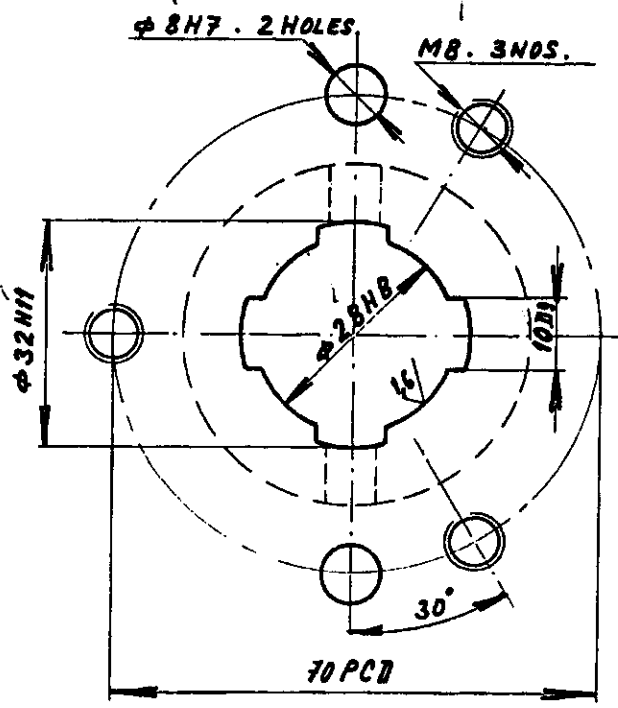
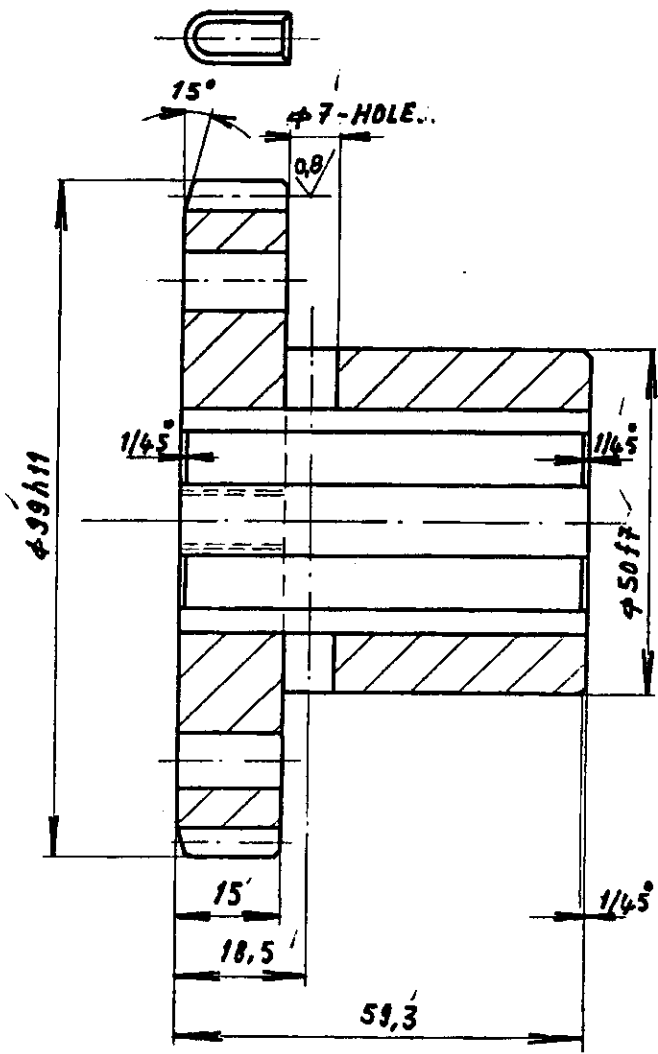
NO OF TEETH	46
MODULE	2.25
PRESSURE ANGLE	20°
QUALITY, TOLERANCE ZONE	9C-DIN-3967
WIDTH ACROSS TEETH. 6T	37.982 ^{-0.158} -0.210
MATING GEAR DRG. NO.	4-M-08a-1936
NO OF TEETH ON MATING GEAR	37
CENTRE DISTANCE	93.375

NO. OF PIECES		DESCRIPTION		SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	ITEM NO.
					C 55 Mn 75 15:5510	55 CB I:5517		1.2		D-M-08a-0098	21
REMARKS					TOTAL NET WT (KG) 6.0008						
SCALE 1:1	DRAWN	C. Shamp...			REFERENCE						
	CHECKED	Kandasamy									
	APPROVED	Kandasamy									
	STDS. OFFICER	Kandasamy									
	DATE	22-9-1967									
MACHINE: H.MI CENTRE LATHE					TYPE: LB 20, 17 & 25 INV. NO.						
TITLE: LB 17-30-327					DRAWING NO:						
SPUR GEAR 46T x Ø 108					4-M-08a ⁰² -1958						
[SPEED BOX] III SHAFT					NO. OF SHEETS						
					SHEET NO:						



10B9	+0.04
	+0.076
φ28H8	+0.00
	+0.033
φ32H11	+0.00
	+0.18
φ50f7	-0.026
	-0.050
φ99h11	-0.00
	-0.22

3.2 / 16/08



NOTE:-
HEAT TREAT TO HRC 28

SPUR GEAR DATA

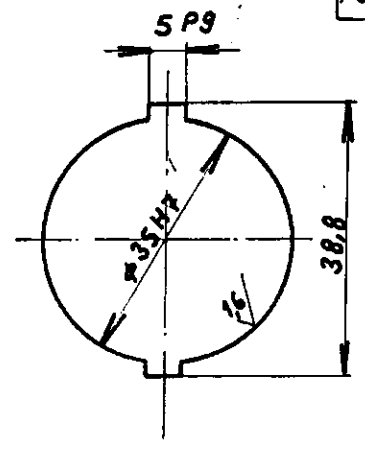
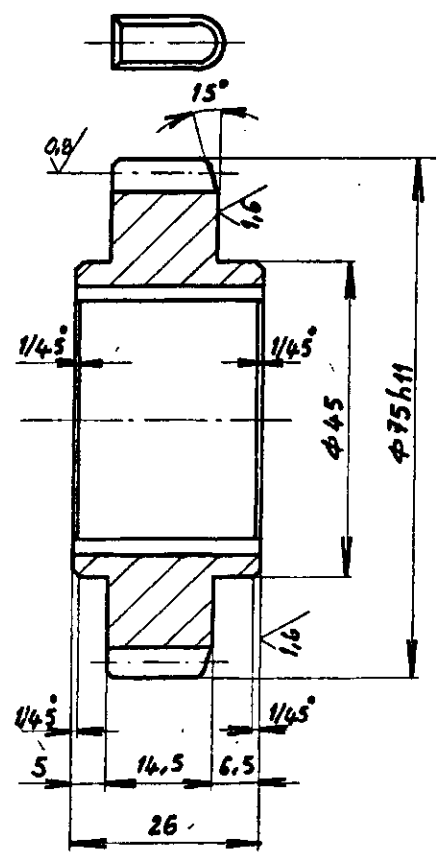
NO OF TEETH	42
MODULE	2,25
PRESSURE ANGLE	20°
QUALITY, TOLERANCE ZONE	9c-DIN-3967
WIDTH ACROSS TEETH. 5T.	31.213 -0.144 -0.128
MATING GEAR DRG. NO.	4-M-08a-1834
NO OF TEETH ON MATING GEAR	41
CENTRE DISTANCE	83.375

		C 55 Mn 75 IS: 5518		55CB IS: 5517	5	0-M-08a-0098 22			
NO. OF PIECES	DESCRIPTION	SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET WT (kg) CC:08		EC:01			
SCALE	DRAWN	REFERENCE		ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX		
1:1	C. Shanmugam								
	CHECKED								
	APPROVED								
	STDS. OFFICER								
	DATE	4-10-1967							
MACHINE: H.M.T. CENTRE LATHE		TYPE: LB 20.17&25		INV. NO.					
TITLE: LB 17.30-325		DRAWING NO:		4-M-08a ⁰² -1959					
SPUR GEAR 42T x φ99		NO. OF SHEETS		SHEET NO:					
[SPEED BOX] III SHAFT									



3.2 / 1.6/00/

φ75H11	-0.00
	-0.22
SP9	-0.012
	-0.042
φ35H7	+0.000
	+0.025

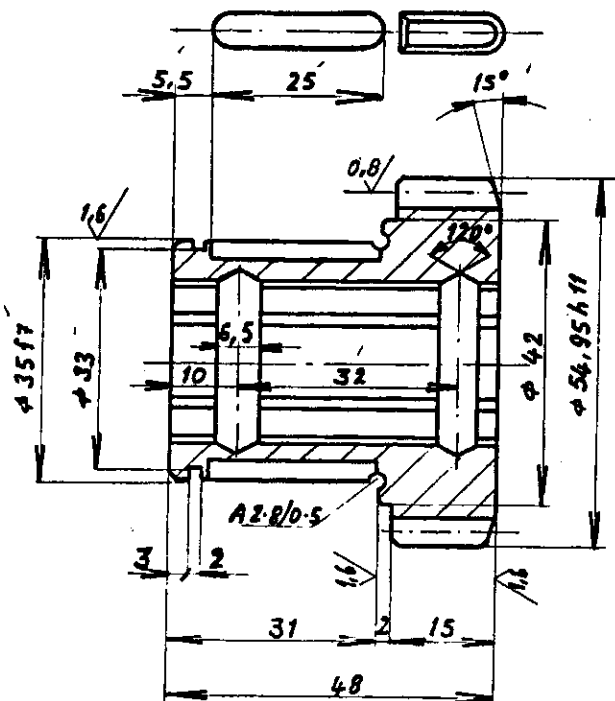


NO OF TEETH	31
MODULE	2.25
PRESSURE ANGLE	20°
CORRECTION FACTOR	+0.167
QUALITY, TOLERANCE ZONE	9C-DIN-3967
WIDTH ACROSS TEETH. 4.	24.4813 ^{+0.11} _{-0.100}
MATING GEAR DRG. NO.	4-M-08A-1835
NO. OF TEETH ON MATING GEAR	32
CENTRE DISTANCE	71.25

HEAT TREAT TO HRC - 28

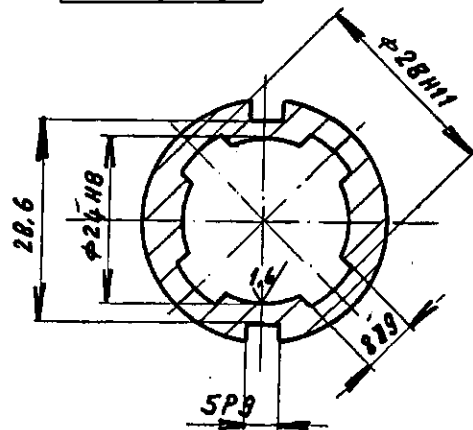
φ75x 26		BM-CQ55		55C8	0.53	0-M-08A-0098	28		
NO. OF PIECES	DESCRIPTION	SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET WT (KG) CC08 EC 01					
SCALE	DRAWN	REFERENCE		ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX		
1:1	CHECKED								
	APPROVED								
	BYDS. OFFICER								
	DATE	21-9-1967							
MACHINE: NMT. CENTRE LATHE				TYPE: LB20.17&25 INV. NO.					
TITLE: LB 17. 30. 321				DRAWING NO:					
SPUR GEAR 31T x φ75				4-M-08A-1961					
[SPEED BOX] I SHAFT.				NO. OF SHEETS SHEET NO:					





SP9	-0.012
	-0.022
FD9	+0.040
	+0.076
$\phi 24H8$	+0.000
	+0.033
$\phi 28H11$	+0.000
	+0.130
$\phi 35f7$	-0.028
	-0.050
$\phi 54.95$	-0.160
h11	-0.000

3.2 / 1.6/0.8



SPUR GEAR DATA

NO OF TEETH	21
MODULE	2.25
PRESSURE ANGLE	20°
CORRECTION FACTOR	+0.712
QUALITY, TOLERANCE ZONE	9C-DIN-3967
WIDTH ACROSS TEETH. 3T.	18.3618 ^{+0.161} -0.180
MATING GEAR DRG. NO.	4-M-08a-1834
NO OF TEETH ON MATING GEAR	417
CENTRE DISTANCE	71.25

HEAT TREAT TO HRC-28.

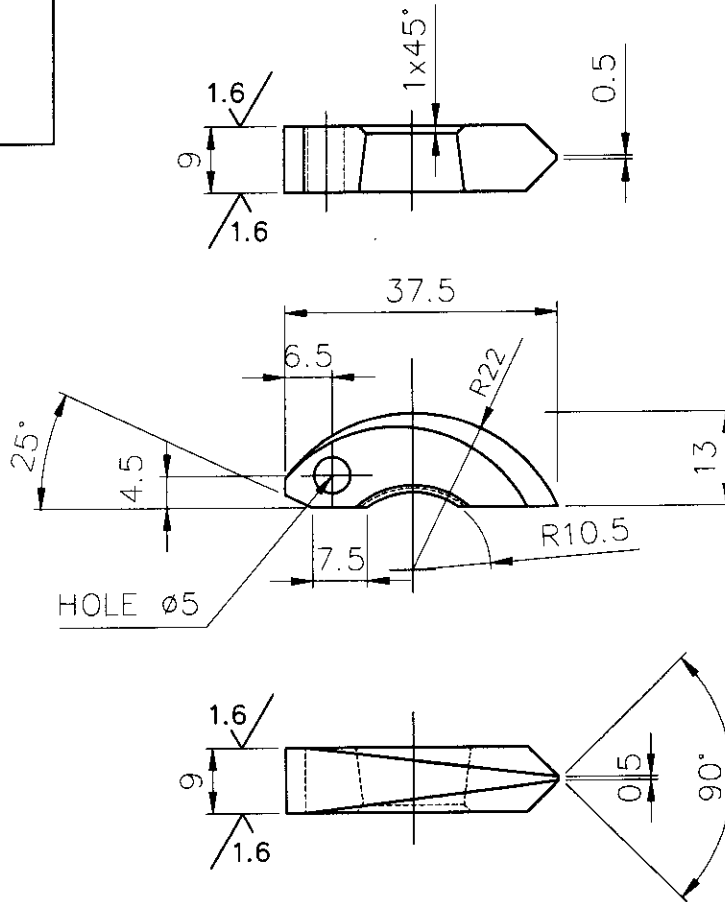
NO. OF PIECES		DESCRIPTION		SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	ITEM NO.
					BM-CQ55	55CB IS:5517		0.58		0-M-08a-0038	29
REMARKS											
SCALE	DRAWN	C. Shanmugam			REFERENCE	TOTAL NET wt (kg)		CC:08	EC:01		
1:1	CHECKED	Mandasamy				ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX		
	APPROVED	[Signature]									
	STDS. OFFICER	[Signature]									
	DATE	4-10-1967									
MACHINE: N.M.T. CENTRE LATHE		TYPE: LB-20.17R25		INV. NO.							
TITLE: LB17.30.320		DRAWING NO:		4-M-08a ⁰² -1962							
SPUR GEAR 21T x $\phi 54.95$		NO. OF SHEETS		SHEET NO:							
[SPEED BOX] I SHAFT											



ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		


3.2//1.6//



NOTE:

1. ALL SHARP CORNERS TO BE REMOVED
2. HORDNESS TO HR_c 45^{±0.2}

CAUTION: THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

ITEM NO	DESCRIPTION	DRAWING NO	IS 5517		0.08	
			55 C8		2	
			MATL CODE		UNIT WT	
			MATL SPEC		QTY	
EQPT: HORIZONTAL MACHINE CENTRE / HMC 800						
 Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014		DRN	C.PONNUSAMY	SIGNATURE	DATE	
		CHD	G.GOVINDARAJ	<i>S. Govindaraj</i>	07/11/14	
		APPD	G.THIAGARAJAN	<i>S. Thiagarajan</i>	07/11/14	
DEPT	GRADE OF UNTOL. DIM	SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO		ITEM
M&S	IS: 2102			2:1	0.16	REF TO OLD DWG NO
CODE				DRAWING NO :		REV
2597				4-M-14A02-29831		00
TITLE			CARD CODE			
SEGMENT			U 01			
(TOOL DRAWBAR ASSY.)						

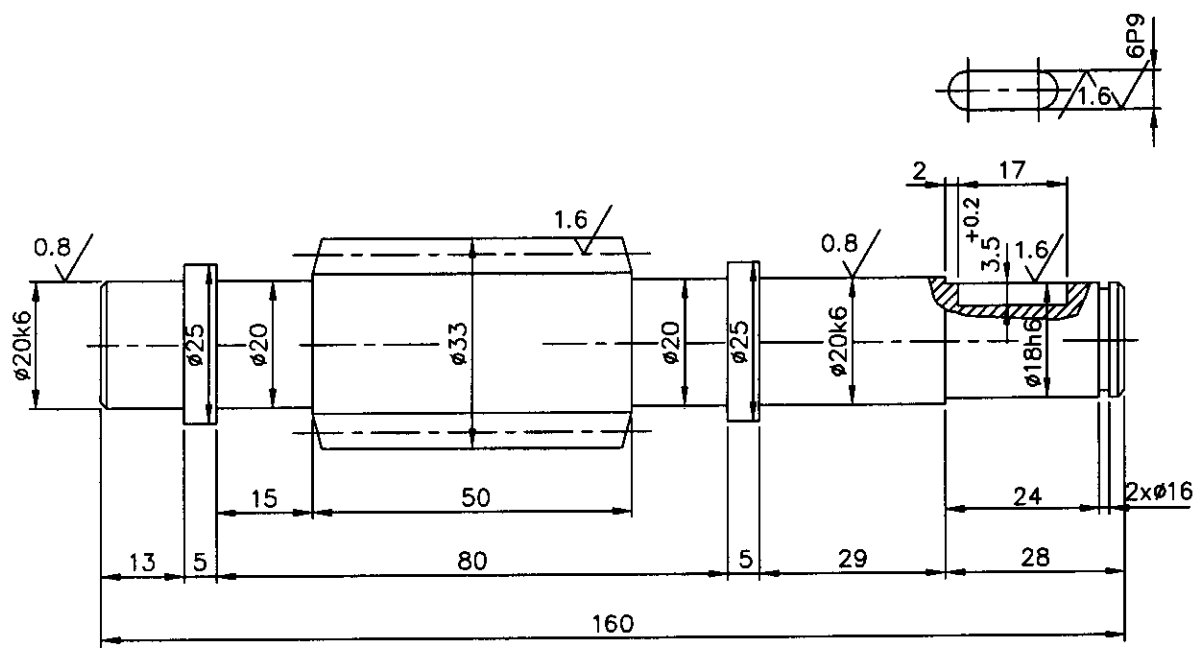
A4-SIZE

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CAUTION:

ALL DIMENSIONS ARE IN MM

6P9	-0.012	ø18h6	-0.000	3.2//1.6/0.8/
	-0.042		-0.011	
ø20k6	+0.015	ø20k6	+0.002	
	+0.002			



NOTE: -

CHAMFER SHARP CORNERS TO 1/45°
HARDENED TO HRC 40⁺²

NO.OF STARTS	DOUBLE
MODULE	2.5
PRESSURE ANGLE	20°
HELIX ANGLE	10° 7' 28"
HAND OF HELIX	R.H
AXIAL PITCH	7.85
MATING WORM No. OF TEETH	30
MATING WORM DRG. No.	4.M.08F12.27961
CENTRE DISTANCE	51.5

ø33x160L		55 C8	IS: 5517	0.40		
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE:		ALTERATIONS:	DCN REF	DATE	SIGN.
SCALE	DRAWN	P.ALBERT ROSS				
1:1	CHECKED	R.RAMAMOORTHY				
	APPROVED	C.S.JAYASHEELAN				
	DATE	15.01.07				
MACHINE: CNC SLANT BED LATHE			TYPE: HMT STC15			
TITLE:			DRAWING No:		REV.	
WORM SHAFT OD33x2Stx160L (CHIP CONVEYOR ASSY.)			4M08F1227960			
			Sheet No:		No. of Sheets:	

CAUTION: THIS DRAWING IS OUR SOLE PROPERTY AND SHOULD NOT BE USED IN ANY FORM FOR ANY PURPOSE WITHOUT THE WRITTEN PERMISSION OF BHARAT HEAVY ELECTRICALS LIMITED

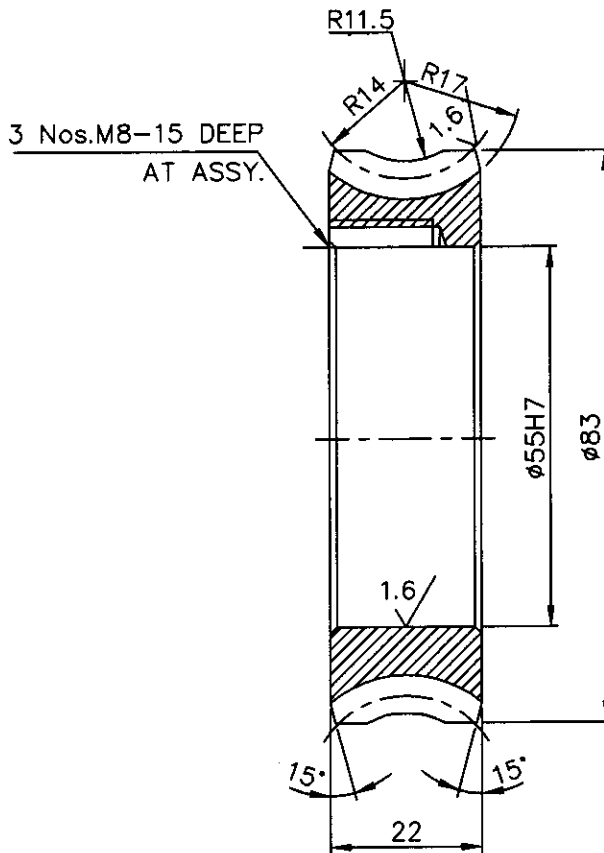
ALL DIMENSIONS ARE IN MM

ø55H7

+0.030

+0.000

3.2//1.6//



NOTE: -

CHAMFER SHARP CORNERS TO $1/45^\circ$

NO.OF TEETH	30
MODULE	2.5
PRESSURE ANGLE	20°
HELIX ANGLE	$10^\circ 7' 28''$
HAND OF HELIX	R.H
MATING WORM No. OF STARTS	DOUBLE
MATING WORM DRG. No.	4.M.08F12.27960
CENTRE DISTANCE	51.5

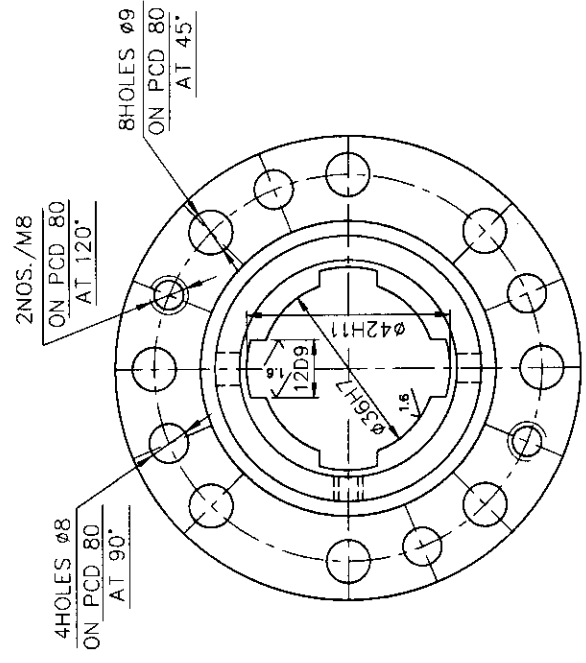
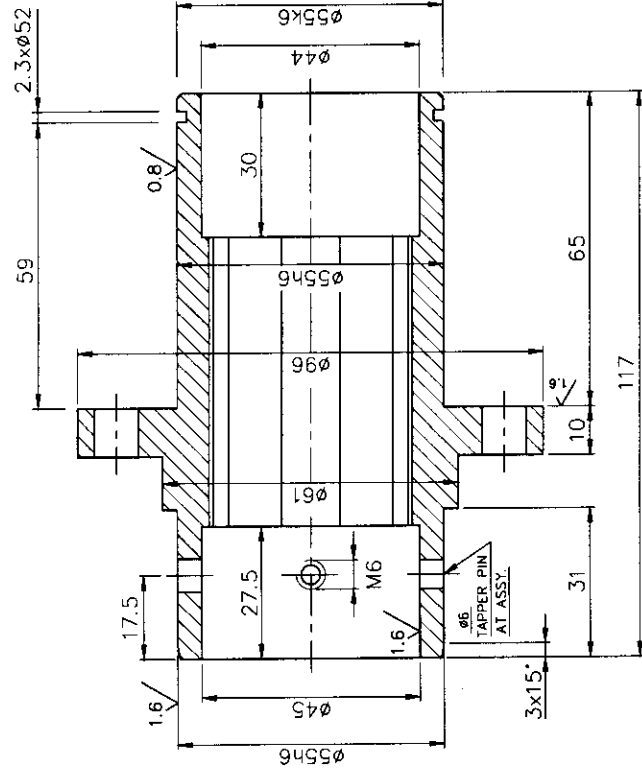
	ø83x22L	Pcu Sn 7	IS: 28	0.50		
X						
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE:		ALTERATIONS:	DCN REF	DATE	SIGN.
SCALE	DRAWN	<i>R. Narayanan</i>				
1:1	CHECKED	R.RAMAMOORTHY				
	APPROVED	C.S.JAYASHEELAN				
	DATE	15.01.07				
	MACHINE: CNC SLANT BED LATHE		TYPE: HMT STC15			
	TITLE:	WORM WHEEL 30TxøD83	DRAWING No:			REV.
		(CHIP CONVEYOR ASSY.)	4M08F1227961			
			Sheet No:		No. of Sheets:	

CAUTION: THIS DRAWING IS OUR SOLE PROPERTY AND SHOULD NOT BE USED IN ANY FORM FOR ANY PURPOSE WITHOUT THE WRITTEN PERMISSION OF BHARAT HEAVY ELECTRICALS LIMITED. TRICHIRAPPALLI - 620 014.

±0.160	±0.025	±0.000	±0.000	±0.000	±0.000	±0.000
0.160	0.025	0.000	0.000	0.000	0.000	0.000
0.160	0.025	0.000	0.000	0.000	0.000	0.000
0.160	0.025	0.000	0.000	0.000	0.000	0.000
0.160	0.025	0.000	0.000	0.000	0.000	0.000
0.160	0.025	0.000	0.000	0.000	0.000	0.000
0.160	0.025	0.000	0.000	0.000	0.000	0.000

0.160	0.025	0.000	0.000	0.000	0.000	0.000
0.160	0.025	0.000	0.000	0.000	0.000	0.000
0.160	0.025	0.000	0.000	0.000	0.000	0.000
0.160	0.025	0.000	0.000	0.000	0.000	0.000
0.160	0.025	0.000	0.000	0.000	0.000	0.000
0.160	0.025	0.000	0.000	0.000	0.000	0.000
0.160	0.025	0.000	0.000	0.000	0.000	0.000

3.2/0.8/1.6



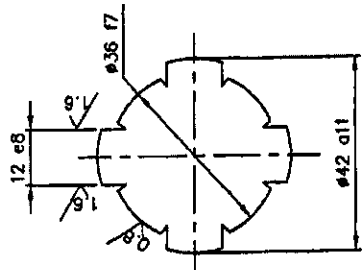
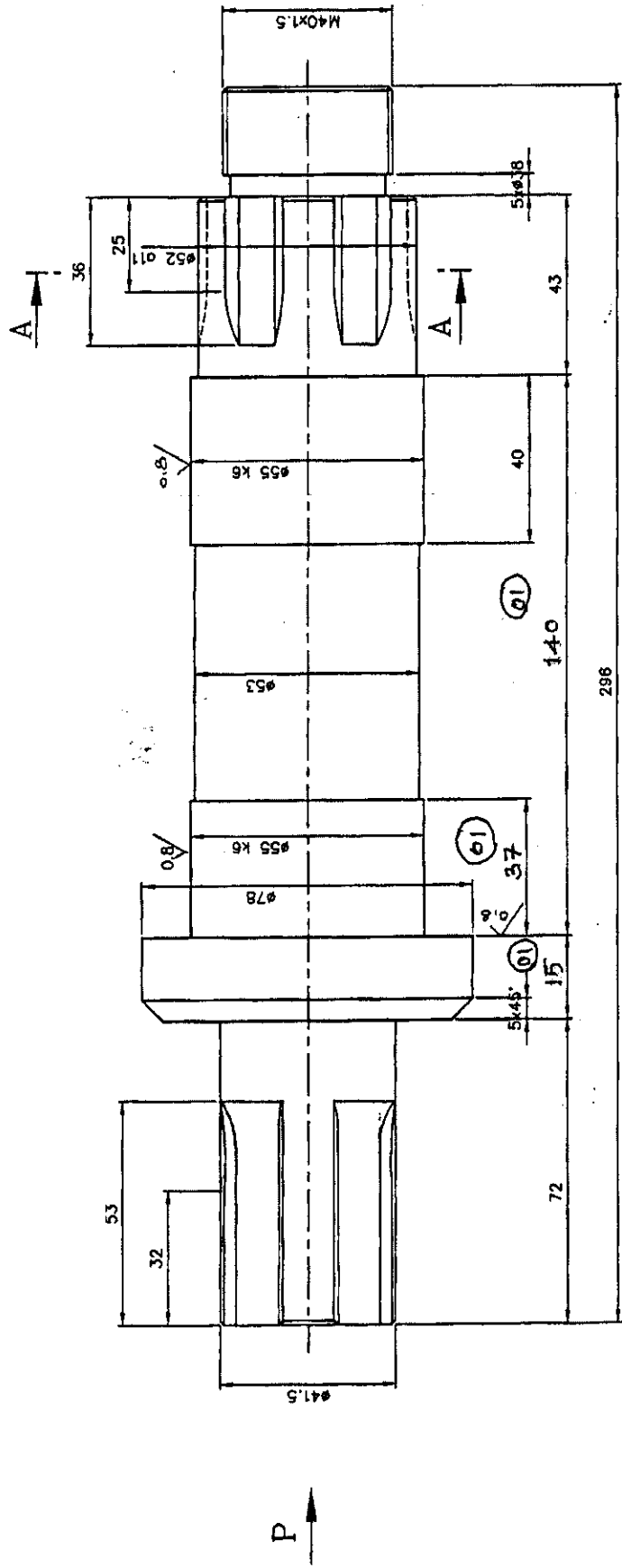
NOTE:
 HARDENED TO HRC 35 ±2
 SHARP CORNERS TO BE REMOVED 1/45°

096x117L	5508	IS: 5517	1.15	
DESCRIPTION	MATERIAL	STANDARD	NET WT. IN KGS.	DRAWING No.
REFERENCE:		ALTERATIONS:	DCN REF	DATE
SCALE	DRAWN	G.G.R		
CHECKED	R. RAMAMOORTHY			
APPROVED	C.S. JAYASHEELAN			
DATE	23-10-10			
MACHINE:	CNC SLANT BED LATHE	TYPE:	HMT-STC 25	
TITLE:	DRAWING No.			
	3M08F12114434			
	Sheet No	No of Sheets:		

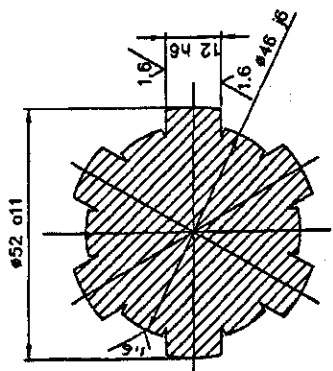
ALL DIMENSIONS ARE IN IN.

CAUTION: THIS DRAWING IS OUR SOLE PROPERTY AND SHOULD NOT BE USED IN ANY FORM FOR ANY PURPOSE WITHOUT THE WRITTEN PERMISSION OF BROWN HEAVY ELECTRICALS LIMITED. (TRIDRAW/P/ALL - 429 014)

±0.021	±0.025	±0.021
+0.002	-0.050	+0.002
+0.011	-0.000	+0.011
-0.005	-0.011	-0.005
-0.032		-0.032
-0.059		-0.059



VIEW-P



SECTION-AA

NOTE:-
HARDENED TO HRC. 55 ±2
CHAMFER ALL SHARP CORNERS TO 1/45°

ROD#78x296 L	55 C8	IS:5517	5, 355	
DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS	DRAWING No.
REFERENCE	ALTERATIONS	DCM REF	DATE	SIGN.
SCALE	P.A.ROSS	DIMN. 15, 37, 140	23.02	SAR
CHECKED	R. Debnath	HRC 55 WERE	16	
APPROVED	SAR	DIMN 20, 32, 135		
DATE	05-12-03	HRC 40 CHANGED		
MACHINING CNC SLANT BED LATHE				
TITLE: SPLINE SHAFT (452-296-6 SPLINE)				
DRAWING No. 3M08F1212371				
REV. 01				
Sheet No. 1 of 1				

CAPITAL PURCHASE
COMMERCIAL TERMS AND CONDITIONS

1.0 QUOTATIONS

The Bidders shall submit the offer in **TWO INNER ENVELOPES** as indicated below which shall be sealed in one outer envelope.

Envelope I This sealed envelope should contain all the copies of technical bid together with un-priced commercial bid & annexure III. This envelope should be clearly marked "**Part I - Technical and commercial bid**",

Indicating Enquiry No., Due Date and Address & Reference of the Bidder.

Envelope II This sealed envelope should contain **price as per Annexure-IV format**. This envelope should be clearly marked "**Part II - Price bid**", indicating **Enquiry No., Due Date and Address & Reference of the Bidder**.

Both the envelopes (Part I & II) shall be put in one cover (**Envelope III**), duly sealed, superscribing as Part I and Part II of Enquiry No., due date of opening and the address and reference of the Bidder

The above offer should reach this office on or before the due date by 14.00 hours (IST). Late offers will not be considered.

Tender should not be addressed to any individual's name

The Tender Opening Cell/MM
Room No-26 , Building – 24 , Ground Floor
Bharat Heavy Electrical Limited
Tiruchirapalli- 620014 .

Tenders should be free from **CORRECTION AND ERASURES**, Corrections if any, must be attested. All Amounts shall be indicated both in words as well as in figures. Where there is difference between amount quoted in words and figures, amount quoted in words shall prevail. Offers should be in **ENGLISH** and accompanied by detailed technical literature, catalogue and detailed dimensional drawings in **ENGLISH** or otherwise, the offers will not be considered.

2.0 OPENING OF TENDERS

The Part I - Technical & commercial bid alone would be opened on the Tender opening date.

The Part II - Price bid of technically suitable Bidders alone would be opened. The Technically Suitable Bidders would be informed about the tender opening date through e-mail.

Clarifications if any required by BHEL for Technical evaluation **would be** sought from Bidders before opening of Part II - price bid

For any queries clarifications the bidders may contact us through our FAX NO. +91 431 2520719 or through e-mail <arunachal@bheltry.co.in >&< chells@bheltry.co.in>

Annexure For Techno Commercial Bid

Check List - to be filled and submitted along with Technical Bid

BHEL Commercial Terms and Conditions for Indigenous Supplies	Vendor's Confirmation / Comments
Technical confirmation to BHEL's Specification as called for in BHEL Format shall be furnished. If needed additional sheets shall be used.	
Prices shall be quoted item wise only as per the model format enclosed	
Prices shall be quoted on " FIRM PRICE " basis only The prices should be only on F.O.R / Despatching station basis with Packing & Forwarding charges if any. Applicable % of ED & Sales Tax, Freight & Insurance, Installation & Commissioning Charges should be clearly indicated	
Validity of offer shall be for a minimum period of 120 days from the date of Tender opening	
Delivery period from the date of Letter of Intent / Purchase order shall be clearly mentioned in the offer	
Liquidated damages @ 10.5% per week subject to a maximum of 10% of the order value shall be applicable for delay in deliveries For Details Refer Annexure- v	
Following Risk Purchase clause shall be applicable The purchaser at his option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or dispatch within the time stipulated or if the same were not available, the best and the nearest available substitute therefore The supplier shall be liable for any loss which the Purchaser may sustain by reason of such risk purchases	
Payment term for supply portion: Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials For details Refer Annexure- v	
Erection / commissioning: (if applicable only) Erection / commissioning charges if any has been mentioned in the offer or else confirmation that Erection /commissioning shall be done at free of cost is available in the offer,	
The equipment shall be guaranteed for a period of 12 months from the date of commissioning	
Final inspection and acceptance of equipment will be after installation at BHEL, Trichy	
The vendor shall provide necessary drawings, Test Certificates and Operating Maintenance Manuals etc., as called for in the Technical Specification, in the required number of copies at no extra cost	
Any warranty replacement during warranty period shall be supplied free of charge on FOR BHEL, Trichy basis.	
Offers should be submitted only in sealed cover super-scribing clearly the Enquiry reference and due date.	
Confirm MSE vendor or not (Incase of MSE vendor necessary documentary proof shall be furnished as per Annexure VI)	
% of Excise Duty with cess	
% of TAX (CST/VAT)-(INGST with FORM-17 or CST with C-FORM)	
Packing & Forwarding Charges (if any in % only)	
Percentage of Freight& transit insurance charges, if any Freight charges from Dispatching station to BHEL, Tiruchirappalli • Supplier should quote for F.O.R-BHEL Trichy Stores.	
As per Commercial terms and conditions, acceptance for participation in Reverse auction (RA).Yes/No to be indicated	
Name of the person for participating reverse auction	
Land Line Number	
Fax Number	
Mobile Number	
E-mail ID	

NOTE:-

- It is confirmed that all the terms and conditions stipulated in the Enquiry have been fully understood by us and all clarifications & details have been obtained.
- Your offer should be indicating applicable if any P&F Charges, % of ED, Sales Tax -CST or VAT, Service Tax), Freight, Insurance and Installation and Commissioning Charges etc., as per our Price Format
- Your specific acceptance to our Payment terms, LD & Risk Purchase Clause are essential for consideration of your offer. Other wise your offer is liable for rejection.
- No row shall be left blank. Please indicate NA, in case the item is "not applicable"

Payment Term (Indigenous)	
If materials are receivable at Stores/Trichy <u>without PBG</u>	Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials.
If materials are receivable at Stores/Trichy <u>with PBG</u>	Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials and against 10% PBG valid for the warranty period.
Any deviation in the above payment term will attract loading as mentioned below. “Base rate of SBI (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.	

Offers of indigenous Suppliers with any other Payment terms will be rejected.

Liquidated Damages / Penalty -

The delivery of the goods specified in the purchase order should be made within the time prescribed. LD for delay in 'Supply' and/or 'E&C' will be applicable to the delays attributed to vendor. LD will be considered separately for 'Delivery' and 'E&C'. Where the seller supplies or dispatches the goods, beyond the delivery period Liquidated damages shall be applicable 0.5% of the total order value per week or part thereof subject to a maximum of 10% of the total order value.

Material Despatched after Due date: Once the delivery due date is crossed, bills have to be clubbed till final despatch and forwarded for processing of payment as a single bunch. LD percentage will be calculated from Delivery due date to final despatch date.

The rate of LD for delayed E&C shall be @ 0.5% per week of delay of total PO value (Supply + E&C) in E&C subject to a maximum of 10% of total PO value (Supply + E&C).

For staggered delivery schedule, LD shall be 0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the total order value.

Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offered value).

For the purpose of Imposing LD, the FOB delivery (B/L date) shall be considered.

Guarantee / Warranty Period – (if applicable)

Normally No deviation permitted and the deviated offers are liable for rejection.

Ranking-

BHEL will consider the ranking after the loading is applied as referred above wherever deviations are observed.

Performance Bank Guarantee – (if applicable)

Normally No deviation permitted and the deviated offers are liable for rejection.

Fraud prevention clause: The bidder along with its associate/collaborator/sub-contractor/sub-vendor/consultants/service providers shall strictly adhere to BHEL fraud prevention policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice.

NOTE:-

1. If the due date of tender opening happens to be a holiday, the tenders will be opened on the next working day.
2. BHEL reserves the right to go for a reverse auction (RA) instead of opening the submitted sealed bid which will be decided after technical evaluation. Information and general terms and conditions covering RA are given in commercial terms and conditions.
3. Corrigendum if any, with respect to this tender will be hosted only in the website <http://www.bhel.com> or <http://tenders.gov.in>. You are requested to visit the website regularly for updates.

Special Provisions for Micro and Small Enterprises (MSE)

1. 20% of the tendered quantity is earmarked for MSE suppliers in this tender.
2. Out of the 20% tendered quantity reserved for MSE suppliers, 4% shall be earmarked for procurement from MSE owned by SC/ST entrepreneurs.
Such Micro/Small Enterprises registered vendors must state the sub-category to which they belong and submit documentary proof for the same. The sub-categories are:
 - (a) Enterprises owned by Scheduled Castes.
 - (b) Enterprises owned by Scheduled Tribes.
 - (c) Enterprises owned by other than above two categories

The enterprises under (a) & (b) means the proprietor in case of single owned firm and all partners in case of partnership firm and all directors in case of private/public limited must belong to SC/ST category.

3. In case MSE vendor participating in the tender quotes within the price band of L1+15%, they will be allowed to supply the portion of the requirement subject to acceptance of L1 price by MSE vendor. In case of more than one such MSE, the supply shall be shared proportionately.
4. "MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with attested copy of a CA certificate (Format enclosed at Annexure -VII where deemed validity of EM II certificate of five Years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer."

Certificate by Chartered Accountant on letter head

This is to Certify that M/S
(hereinafter referred to as 'company') having its registered office at
..... is registered under MSMED Act 2006, (Entrepreneur
Memorandum No (Part-II) dtd:.....,
Category: (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as on
date..... as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O.1722(E) dated October 5, 2006 :
Rs.....Lacs
2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:
Rs.....Lacs

The above investment of Rs.....Lacs is within permissible limit of
Rs.....Lacs forMicro / Small (~~Strike off which is not applicable~~)
Category under MSMED Act 2006.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant