



BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)

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

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PHONE :2577331
GRAMS : BHARATELEC
FAX NO: 2520719
E-mail: srchandran@bheltry.co.in
Web:

429-002/A

	Enquiry No 2661400872 - 55	Enquiry Date 28.11.2014	Due Date for Quotation 26.12.2014
Please quote Enquiry No, Date and due date in all correspondences. This is only a request for quotation and not an order			

Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	7504D0702500 PINION SHAFT AS PER DRG. NO. 3M-04D-07-15037 NOTE: FOR SL.NO. 10 TO 30 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY. VENDOR QUALIFYING CRITERIA Only those vendors who satisfy the following conditions will get qualified to participate in the tender: 1.,,Vendor should have minimum 3 years of experience in this field. 2.,,Previous PO details for supplying similar kind of items to BHEL and/or any-other Organisation should be submitted along with offer. Otherwise offer will be rejected. 3.,,Company profile details has to be provided along with offer. 4.,,BHEL reserves the right to visit the vendor's works for verifying the manufacturing facilities and any other credential furnished by the vendor. In case the information furnished with the offers found to be false /incorrect, the offer shall be rejected.	NO	4.000	4.00	25.02.15
20	7504D0702600 PINION SHAFT AS PER DRG. NO. 3M-04D-07-15036	NO	4.000	4.00	25.02.15
30	7504D0702700 RACK AS PER DRG. NO. 3M-04D-07-15035	NO	20.000	20.00	25.02.15
40	7508F0302000 SCREW ROD (LH) AS PER DRG.NO. 3M-08F-03-13679 NOTE: FOR SL.NO. 40 TO 60 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	2.000	2.00	25.02.15
50	7508F0302100 LOCK NUT AS PER DRG.NO. 4M-08F-03-28256	NO	3.000	3.00	25.02.15

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.

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

MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,



BHARAT HEAVY ELECTRICALS LIMITED

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2661400872 / 28.11.2014

60	7508F0302200 BOX NUT (LH) AS PER DRG.NO. 4M-08F-03-28255	NO	3.000	3.00	25.02.15
70	7508F0302300 SCREW ROD (LH) AS PER DRG.NO. 3M-08F-03-13680 NOTE: FOR SL.NO. 70 AND 80 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	2.000	2.00	25.02.15
80	7508F0302400 BOX NUT (LH) AS PER DRG.NO. 4M-08F-03-28254	NO	3.000	3.00	25.02.15
90	7508F0301400 ROLLER CHAIN FLEXIBLE COUPLING AS PER DRG NO:3M-08F-03-9266	NO	2.000	2.00	25.02.15
100	7508F0302500 SLIDE BODY AS PER DRG.NO. 3M-08F-03-7278	NO	2.000	2.00	25.02.15
110	7508F0302600 SHAFT III AS PER DRG.NO. 3M-08F-03-7801	NO	2.000	2.00	25.02.15
120	7508F0302700 SPUR GEAR AS PER DRG.NO. 4M-08F-03-26714	NO	2.000	2.00	25.02.15
130	7508F0300200 WORM AS PER DRG NO. 3M-08F-03-8590 NOTE: FOR SL.NO. 130 AND 140 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	2.000	2.00	25.02.15
140	7508F0302800 WORM WHEEL AS PER DRG.NO. 4M-08F-03-19450	NO	2.000	2.00	25.02.15
150	7508F0302900 WORM SHAFT AS PER DRG.NO. 3M-08F-03-8597 NOTE: FOR SL.NO. 150 AND 160 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	2.000	2.00	25.02.15
160	7508F0303000 WORM WHEEL AS PER DRG.NO.	NO	2.000	2.00	25.02.15

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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.

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


MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,



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2661400872 / 28.11.2014

4M-08F-03-26536

170	7508F0303100 BRACKET AS PER DRG.NO. 3M-08F-03-9007	NO	2.000	2.00	25.02.15
180	7508F0303200 DRIVE SHAFT AS PER DRG.NO. 3M-08F-03-9008	NO	3.000	3.00	25.02.15
190	7508F0303300 FLANGE AS PER DRG.NO. 3M-08F-03-9009	NO	2.000	2.00	25.02.15
200	7508F0303400 LINING PLATE AS PER DRG.NO. 3M-08F-03-9010	NO	20.000	20.00	25.02.15
210	7508F0303500 LINING PLATE AS PER DRG.NO. 3M-08F-03-9011	NO	20.000	20.00	25.02.15
220	7508F0303600 PINION SHAFT IV AS PER DRG.NO. 3M-08F-03-9308	NO	2.000	2.00	25.02.15
230	7508F0303700 BRG. HOUSING AS PER DRG.NO. 3M-08F-03-9309	NO	2.000	2.00	25.02.15
240	7508F0303800 SPUR GEAR AS PER DRG.NO. 3M-08F-03-9310 NOTE: FOR SL.NO. 240 AND 250 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	2.000	2.00	25.02.15
250	7508F0303900 SPUR GEAR AS PER DRG.NO. 3M-08F-03-7814	NO	2.000	2.00	25.02.15

General Note:

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

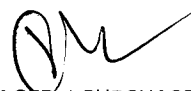
ENCLOSURES:ANNEXURE II,III,IV,V,VI,VII.

Enclosures:

"LD clause has to be confirmed without fail."

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


MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,

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 but only by designation to

**SENIOR MANAGER /PURCHASE/ CP & SP/ MM / MFG
BHARAT HEAVY ELECTRICALS LIMITED
HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620 014
TAMIL NADU**

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 <mmcpmfg1@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 @ '0.5% 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.	
% 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"

Annexure For Price Bid

Bharat Heavy Electricals Limited TIRUCHIRAPPALLI CAPITAL PURCHASE
MODEL PRICE BID FORMAT FOR INDIAN BIDDERS

Annexure-IV

Enquiry No. & Date:

Bidder's Offer No. & Date:

SI No	Description of item	Unit	Quantity	Rate in Rs.	Value in Rs.
	TOTAL VALUE IN RS.				
	Packing & Forwarding charges in % if any				
	Freight & Insurance Charges In % if freight charges are not mentioned it will be considered as FOR-BHEL TRICHY.				
	Excise Duty (indicate in %)				
	A) TNGST — VAT (%)				
	B) CST with C-FORM — (%)				
	C) CST without C-Form — (%)				
	Approximate Net weight of the total consignment				
	Approximate Gross weight of the total consignment				
	Approximate Dimensions of the Consignment				
	The price indicated shall be inclusive of all accessories, spares etc. as given in the scope of supply. Individual item-wise break-up price shall be attached as an annexure to this price bid format.				

Signature & Seal of Vendor

NOTE:

1. The price bid should be submitted only as per the above format. No row shall be left blank. Please indicate NA, in case the item is "not applicable".
2. Prices shall be quoted Item-wise only as per the above format.
3. If Price quoted is Inclusive of ED, the included ED Value and Base Value shall be indicated item-wise.

Payment Term (Indigenous)	
If materials are receivable at Stores/Trichy <u>without</u> PBG	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</u> PBG	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.	

Payment through Bank is not preferred. In case of Payment through Bank is opted by Supplier, BHEL prefers documents submission through bank with copy of LR and door delivery of Goods to Site/Stores with Consignee copy attached. In this case Loading will be 3% on the offered value.
Offers of indigenous Suppliers with payment terms as LC/Advance Payment are liable for rejection.

Liquidated Damages / Penalty -
Liquidated damages shall be 0.5% of the total order value per week or part thereof subject to a maximum of 10% of the total order value.
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).

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.

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.
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 -

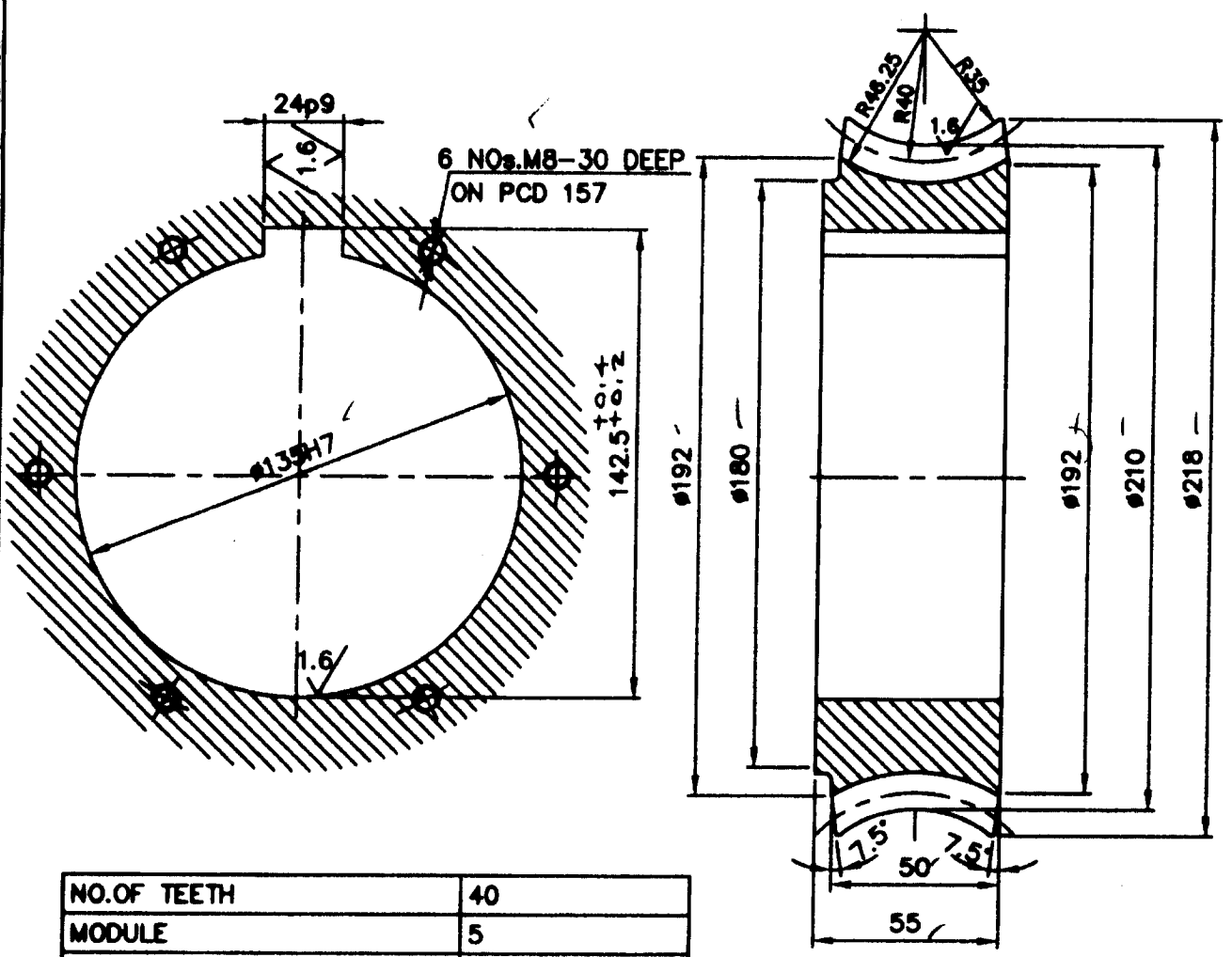
Membership number -

Seal of Chartered Accountant

ALL DIMENSIONS ARE IN MM

24 p9	-0.022	Ø135 H7	+0.040	3.2/1.6/✓
	-0.074		+0.000	

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 TROOPHALLI - 688 84.



NO. OF TEETH	40
MODULE	5
PRESSURE ANGLE	15°
HELIX ANGLE	3° 34'
HAND OF HELIX	LH
MATING WORM NO. OF STARTS	1
MATING WORM DRAWING NO:	3-M-08F-8597
CENTRE DISTANCE	140

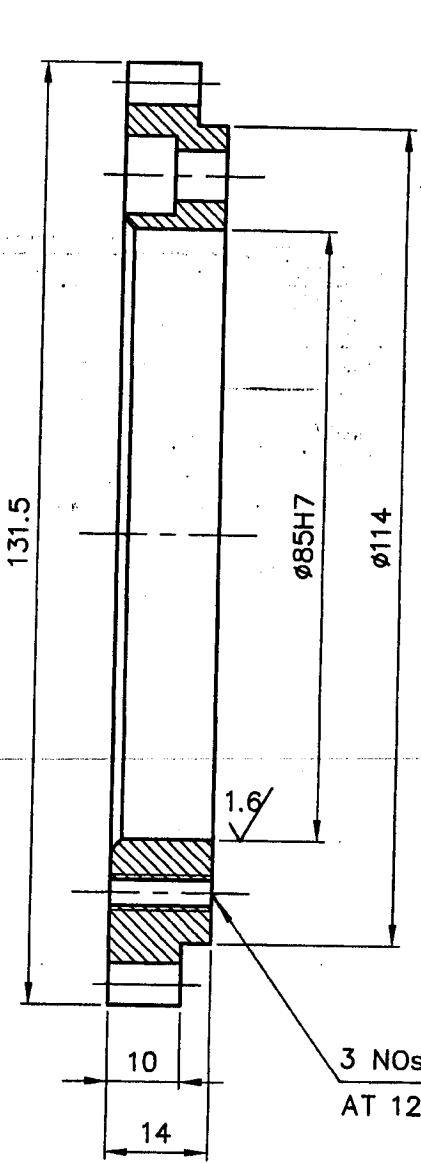
CHAMFER ALL SHARP CORNERS TO 1/45°

<input checked="" type="checkbox"/>		PCm Sn7	IS: 28	8.5	1-M-08F-0987	45
DESCRIPTION		MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	TYP
REFERENCE:			COMPONENT CODE: 10	EQUIPMENT CODE: 03		
SCALE	DRAWN	P.A. ROSS / GSK	ALTERATIONS:	DCN REF	DATE	SIGN.
1:2	CHECKED					
	APPROVED					
	DATE	04-01-2000				
MACHINE: DEEP HOLE BORING LATHE			TYPE: 60-6-FLB (PTC 400)			
TITLE:			DRAWING No. 03		REV.	
WORM WHEEL 40xØ218 (DRIVE ASSY)			4-M-08F-26536			
			Sheet No.		Sheet No.	

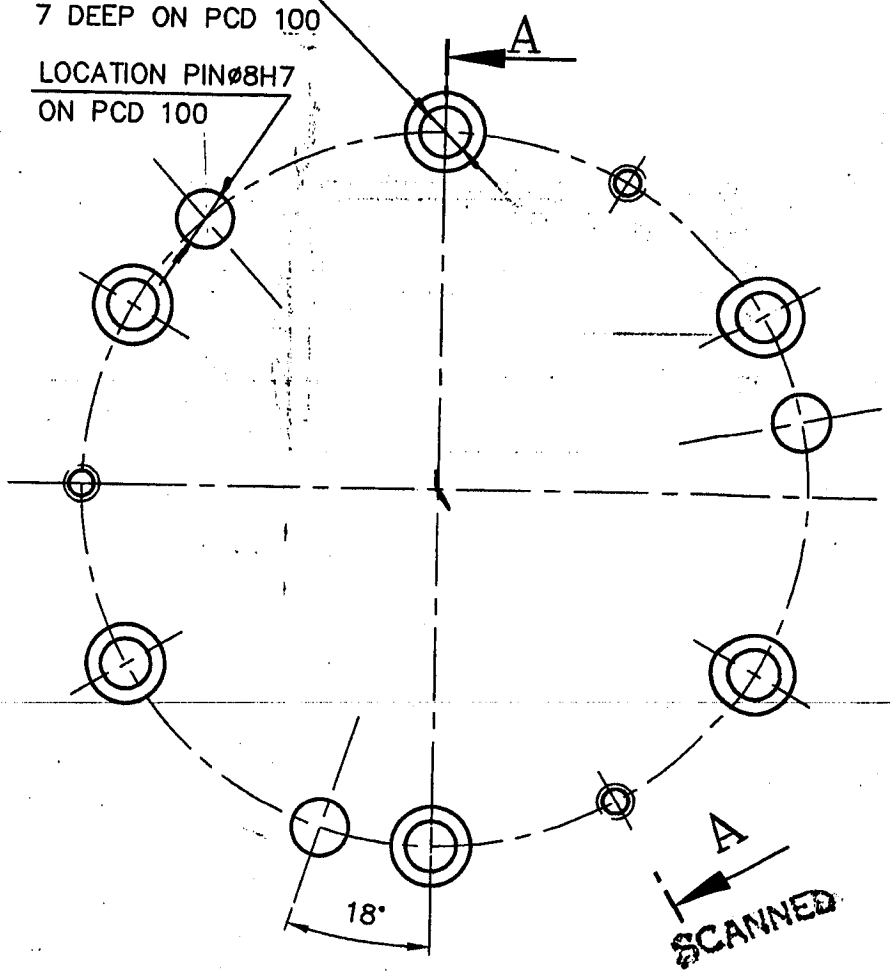
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ALL DIMENSIONS ARE IN MM

$\phi 8H7$	+0.015 +0.000	$\phi 85H7$	+0.035 +0.000	3.2/1.6/✓
------------	------------------	-------------	------------------	-----------



6HOLES $\phi 7$ CBR $\phi 11$
7 DEEP ON PCD 100
LOCATION PIN $\phi 8H7$
ON PCD 100



3 NOS. M5 ON PCD 100
AT 120°

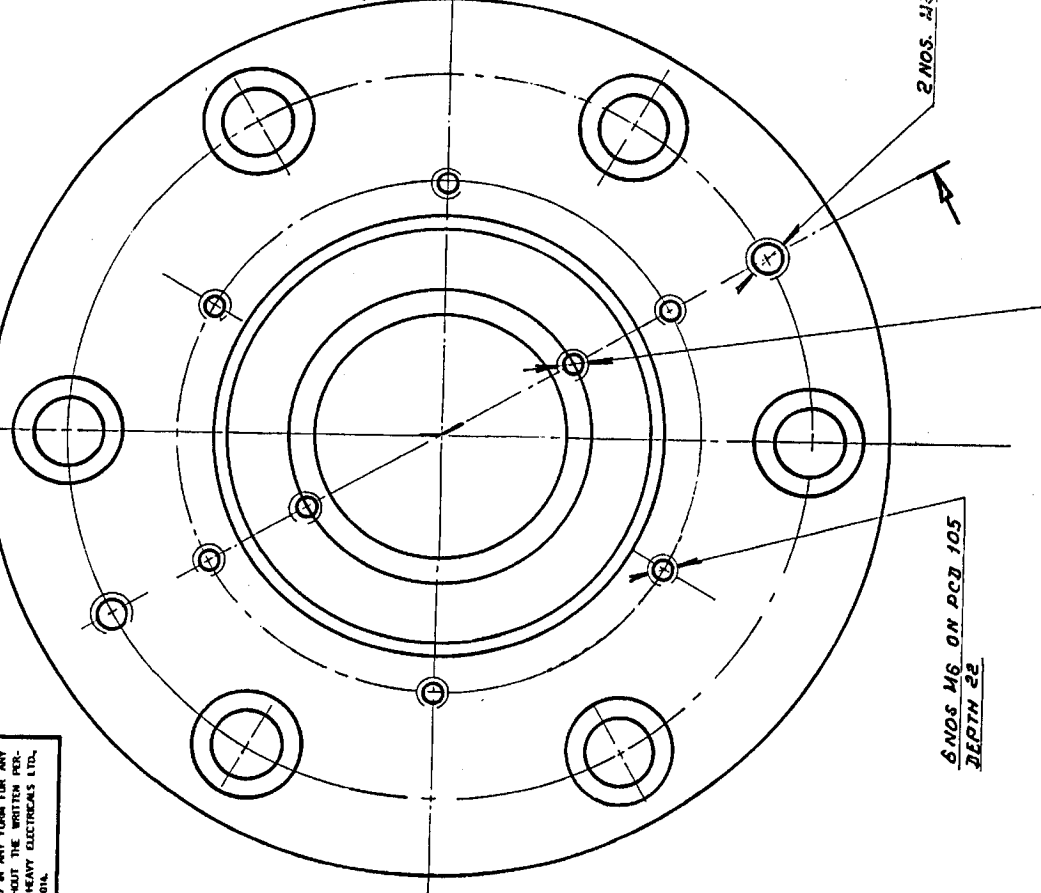
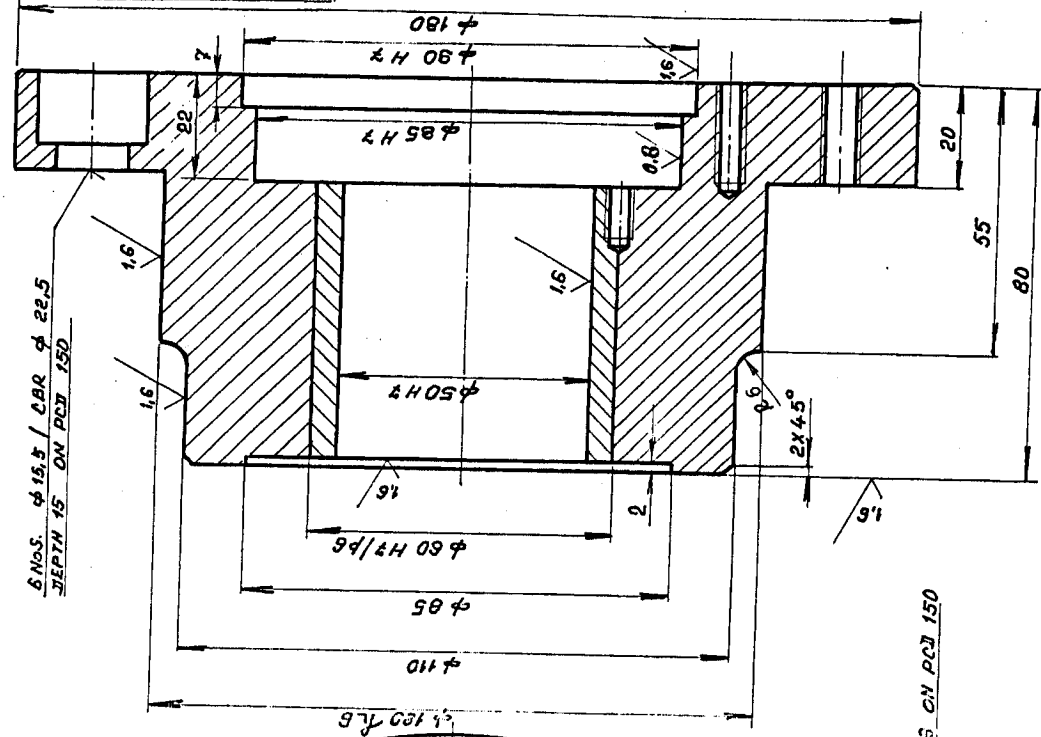
NO. OF TEETH	64
MODULE	2
PRESSURE ANGLE	20°
WIDTH ACROSS 6 TEETH	34.14 -0.158 -0.210
CORRECTION FACTOR	NIL
QTY. & TOL. ZONE	9c DIN 3967
MATING GEAR NO. OF TEETH	INTERNAL GEAR
MATING GEAR DRAWING NO:	
CENTRE DISTANCE	

TOPPING EFFECTED
AVOID SHARP CORNERS

No. of Pieces	DESCRIPTION	MATERIAL	IS: 28	0.82	3-M-08F-11455	02
			STANDARD	NET.WT. IN KGS.	DRAWING No.	ITEM No.
REFERENCE:		ALTERATIONS:	COMPONENT CODE: 08	EQUIPMENT CODE: 03		
SCALE	DRAWN		DCN REF	DATE	SIGN.	INDEX
1:1	CHECKED					
	APPROVED					
	DATE	21-02-2001				
MACHINE	DEEP HOLE BORING LATHE		TYPE: 60-6-FLB(PTC 400)			
	TITLE:	SPUR GEAR - 64 T / $\phi 131.5$		DRAWING No: 03		REV.
(ELE. MAGNETIC CLUTCH ASSY.)		4-M-08F-26714		No. of Sheets: Sheet No:		

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3.2 / 15 / 08	±0.030
±0.000	
±0.051	
±0.032	
±0.035	
±0.000	
±0.030	
±0.000	
±0.022	

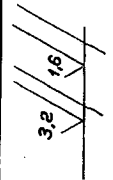
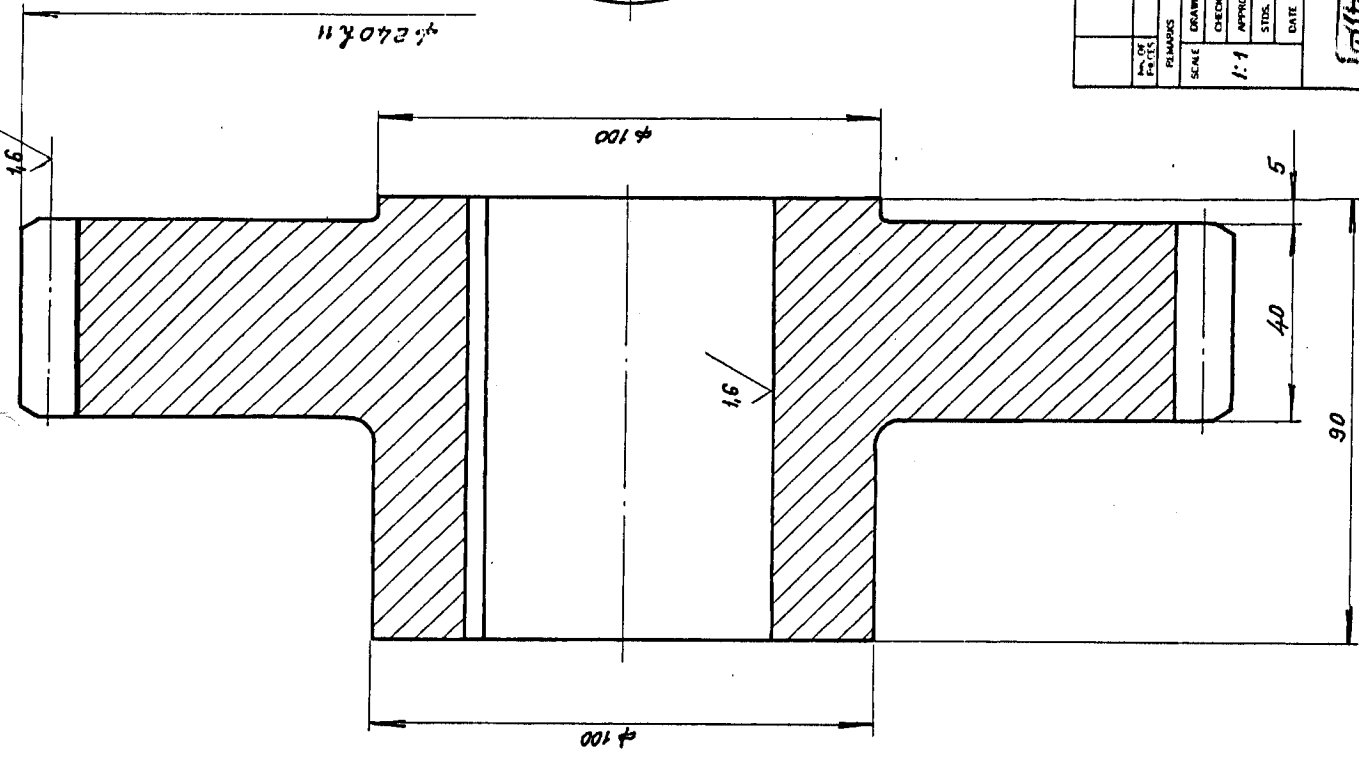


NO. OF SHEETS	1	DESCRIPTION	BUSHING	INITIAL MATERIAL	SCRAP NET WT.	NET CROSS WT.	DRAWING No.	ITEM No.
SCALE	1:1	CHECKED	<i>[Signature]</i>	TOTAL NET WT. (kg)				
APPROVED	<i>[Signature]</i>	DATE	29.05.85	ALTERATIONS				
SIGNATURE	<i>[Signature]</i>	DATE						
DATE								

BUSHING	P. Cu Sn x	1. M. 08F. 0387 74
	15.25	
BRG. HOUSING	C 45	1. M. 08F. 0387 72
	15.20 23	

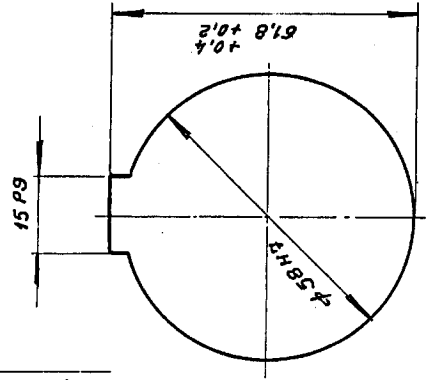
BRG. HOUSING
 TYPE: 80' - 6 FLB
 DRAWING No. **3.M.08F-9309**
 No. OF SHEETS: 1

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 OTHER PURPOSE WITHOUT THE WRITTEN PER-
 MISSION OF BHARAT HEAVY ELECTRICALS LTD.,
 TELCO-PUNLI - 620 014.



φ 58 H7	+0,030
	+0,000
15 P9	-0,018
	-0,061
φ 240 R11	-0,000
	-0,290

NO. OF TEETH 38
 MODULE 6
 PRESSURE ANGLE 20°
 CORRECTION FACTOR -
 WIDTH ACROSS 5 TEETH . 82,9 -0,200
 QUALTY & TOL.ZONE 9C JIN 386Z
 CENTRE DISTANCE 171
 MATING GEAR No. OF TEETH 19
 MATING GEAR JRG. No. J.M.08f.2814



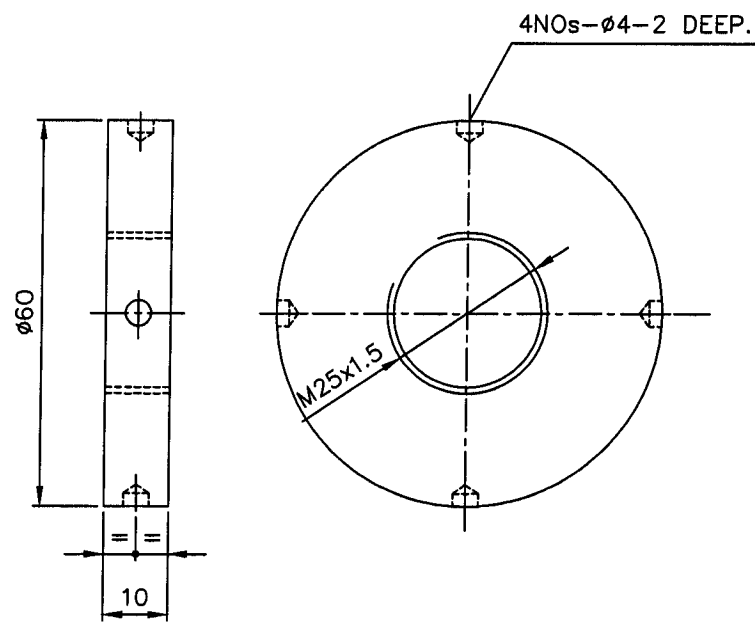
ASSY.	DESCRIPTION	SEM-PRODUCT	INITIAL MATERIAL	FINAL MATERIAL	INITIAL MATERIAL	NET CROSS	DRAWING No.	ITEM No.
			13N13C130	15:4432			1-M.08f.0881	50
SCALE	DRAWN	CHECKED	APPROVED	STDS. OFFICER	DATE	ALTERATIONS	DATE	SIGNATURE
1:1						MATL. ALTERED	19-4-85	[Signature]
REFERENCE		29.05-85		JEEP HOLE BORING LATHE		TYPE: 60-L-6 F1A		
DRAWING No.		3-M.08f.9310		03		SHEET No.		
TITLE:		SPUR GEAR 387/4240						

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CAUTION:

ALL DIMENSIONS ARE IN MM

3.2/1 ✓



NOTE: -
CHAMFER ALL SHARP CORNERS TO 1/45°

FOR MATING SCREW ROD REF.DRG No.3M08F0313680 &13679

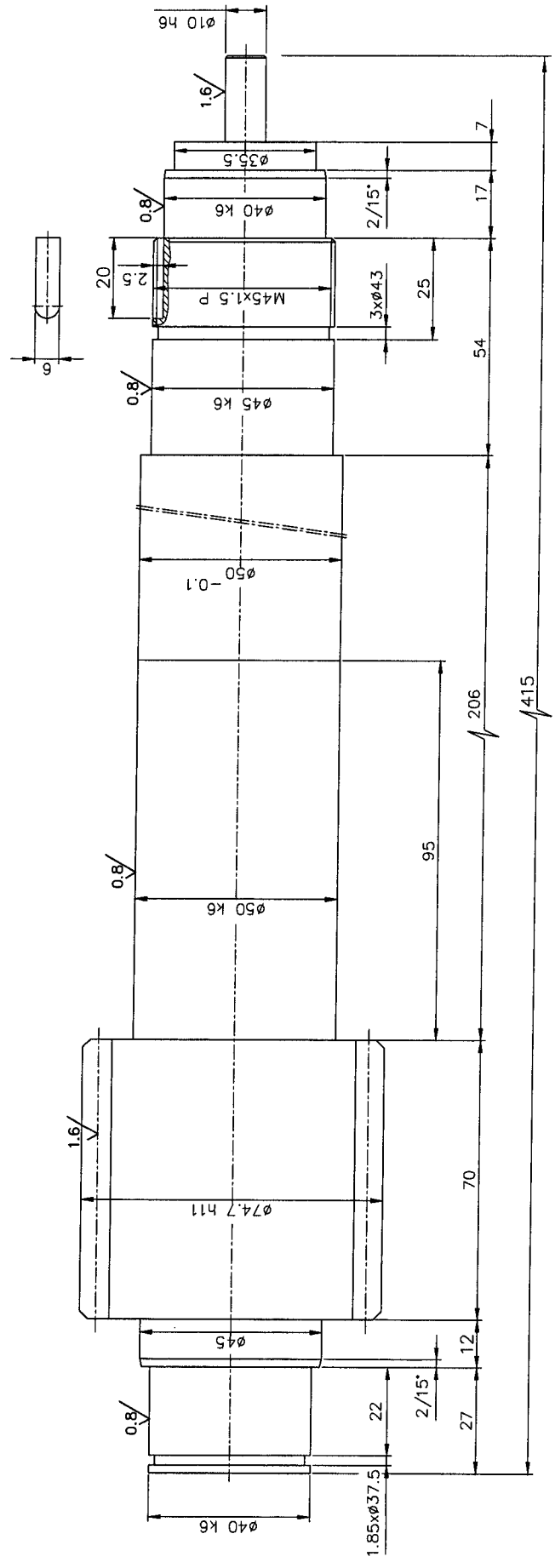
	ø60x10t	45 C8	IS: 7283	0.22			
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.	
	REFERENCE:		ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX
SCALE 1:1	DRAWN	P.A.ROSS					
	CHECKED	R.RAMAMOORTHY					
	APPROVED	C.S.JAYASHEELAN					
	DATE	25-10-08					
	MACHINE: CENTRE LATHE	TYPE: PTC 400					
	TITLE:	DRAWING No:					
	LOCK NUT M25x1.5 P (CROSS SLIDE ASSY.)	4M08F0328256					
	Sheet No:		No. of Sheets:				

ALL DIMENSIONS ARE IN MM

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Ø10 h6	-0.000	+0.018	Ø45 k6	+0.021	Ø50 k6	-0.000	Ø10 h6
	-0.011	+0.002	Ø40 k6	+0.002	Ø74.7 h11	-0.000	
						-0.190	

3.2/1.6/0.8



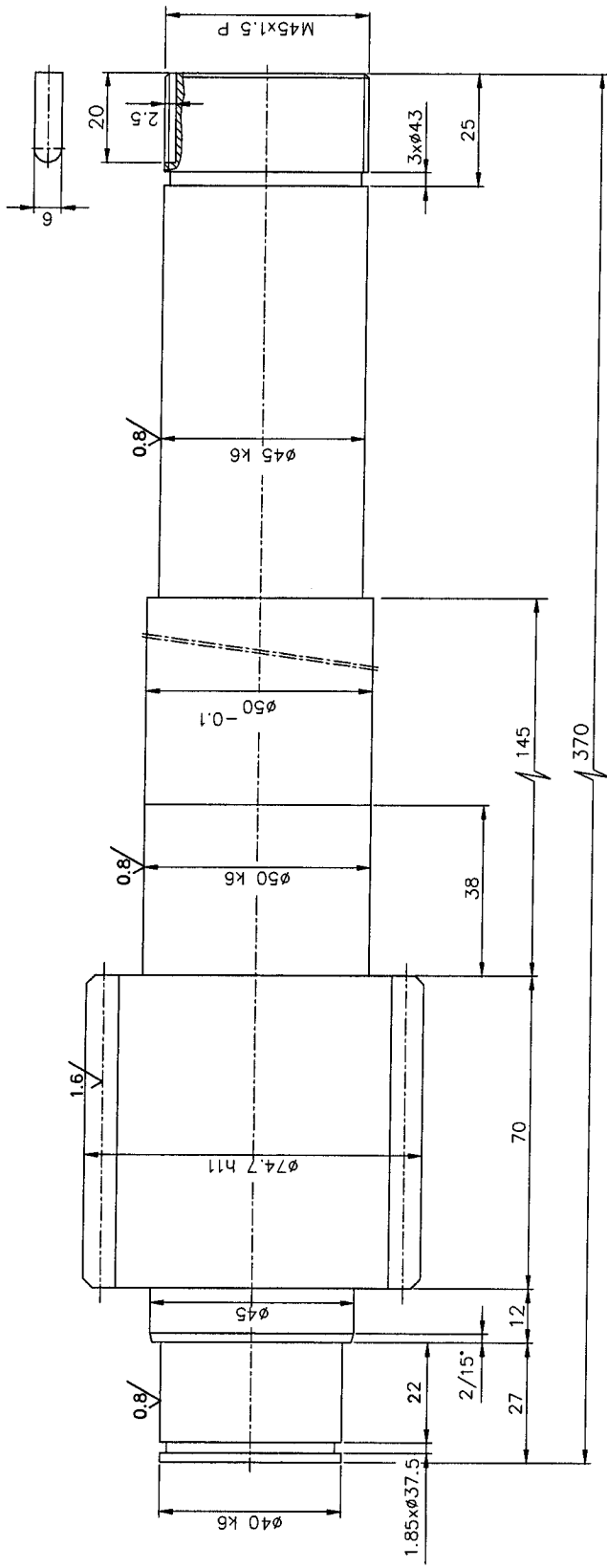
NOTE:
AVOID SHARP CORNERS
HARDENED TO HRC.35 ±2

NO. OF TEETH	14
MODULE	4.5
PRESSURE ANGLE	20°
WIDTH ACROSS 2 TEETH	21.72 -0.158 -0.210
CORRECTION FACTOR	+0.3
Q.LTY. & TOL. ZONE	9e DIN 3967
MATING GEAR NO. OF TEETH	RACK
MATING GEAR DRAWING NO.	3M04D0715035
CENTRE DISTANCE	-

DESCRIPTION	Ø75x415 L	MATERIAL	55 C8	IS: 5517	NET WT. IN KGS.	7.38
REFERENCE		STANDARD				
SCALE	1:1	ALTERATIONS				
DRN.	P. Albert Ross	DCN REF				
CHD.	G. Govindaraj	DATE				
APP.	K. Ramanan					
DATE	03-01-13					
MACHINE: N.C GANTRY DRILLING						
TITLE: PINION SHAFT						
14T/Ø74.7-415 L (X-AXIS)						
TYPE: Y 1208						
DRAWING No: 3M04D0715037						
REV.						
Sheet No						No. of Sheets

ALL DIMENSIONS ARE IN MM

±0.021	±0.002	±0.018	±0.002	±0.000
φ50 k6	φ45 k6	φ74.7 h11	φ40 k6	-0.190
3.2/1.6/0.8/				



NOTE:
AVOID SHARP CORNERS
HARDENED TO HRC.35 ±2

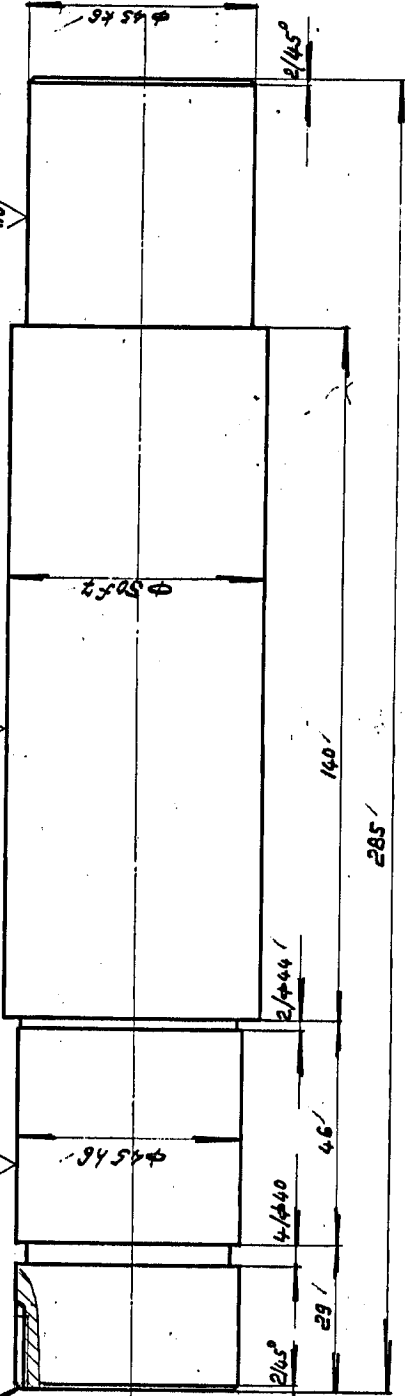
NO. OF TEETH	14
MODULE	4.5
PRESSURE ANGLE	20°
WIDTH ACROSS 2 TEETH	21.72
CORRECTION FACTOR	+0.3
Q.LTY. & TOL. ZONE	9e DIN 3967
MATING GEAR NO. OF TEETH	RACK
MATING GEAR DRAWING NO.	3M04D0715035
CENTRE DISTANCE	-

φ75x370 L	55 C8	IS: 5517	6.98
DESCRIPTION	MATERIAL	STANDARD	NET WT. IN KGS.
REFERENCE:	ALTERATIONS:	DCN REF	DATE
SCALE DRN.	P. Albert Ross	DRAWING No.	SIGN.
CHD.	G. Govindaraj		
APP.	K. Ramanan		
DATE	03-01-13		
MACHINE:	N.C GANTRY DRILLING	TYPE:	Y 1208
TITLE: PINION SHAFT			
14T/φ74.7-370 L			
(X-AXIS)			
DRAWING No:			REV.
3M04D0715036			
Sheet No			No. of Sheets

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SHARAT HEAVY ELECTRICALS LIMITED
 TRUCHIRAPALLI-513 014

M12-16 DEEP AT ASSY



445 H6	-0.000
	-0.016
445 K6	+0.018
	+0.002
450 F 7	-0.025
	-0.050

32 / 16

HOLDING PRICE		DESCRIPTION		SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP WT.	WROCK	DRAWING NO.	ITER
REMARKS		MACHINE DEEP HOLE DRILLING LATHE			BM-C45				1-M-08F-387	13
SCALE	DRAWN	CHECKED	APPROVED	SIGS OFFICER	DATE	ALTERNATIONS	DATE	SIGMA	ITER	DES
1/1					5-3-80					
TITLE		SHAFT III		TYPE: 60-6FL8		DRAWING NO.		3-M-08F-7801		NO. OF SHEETS.
MACHINE DEEP HOLE DRILLING LATHE										SHEET NO.

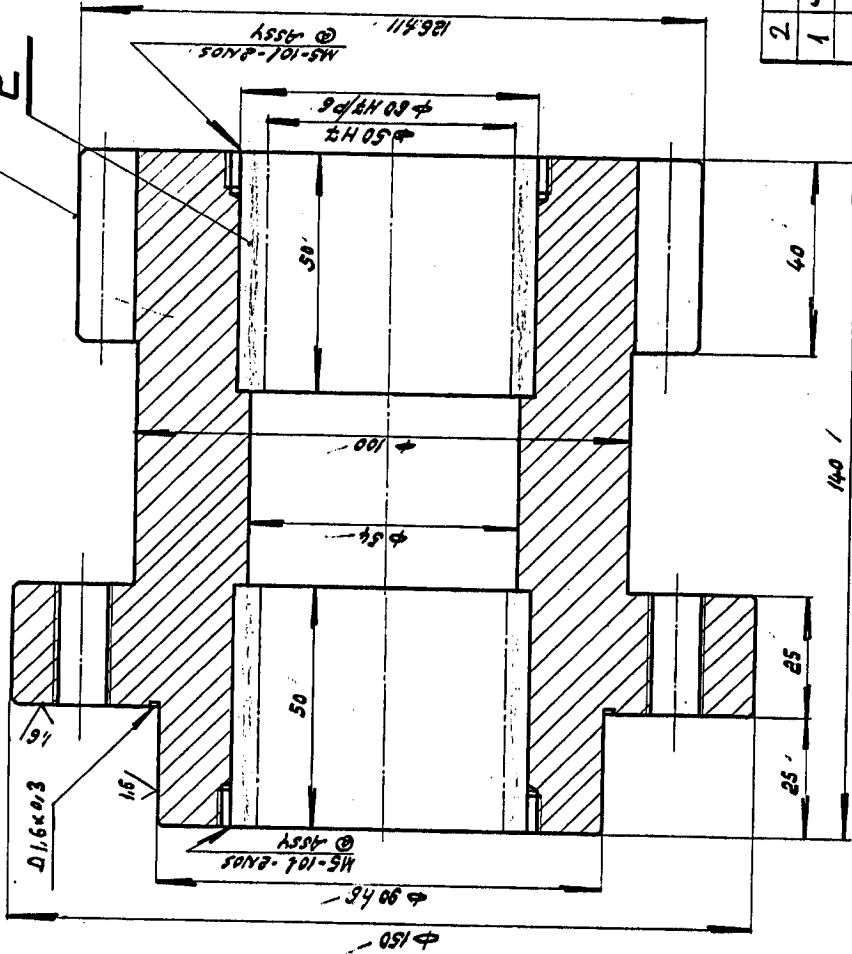
CAUTION
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 OTHER PURPOSES WITHOUT THE WRITTEN
 PERMISSION OF THE WRITER
 BHARAT HEAVY ELECTRICALS LIMITED
 TRICHIRAPALLI-528 014

INDEX No. 39-608

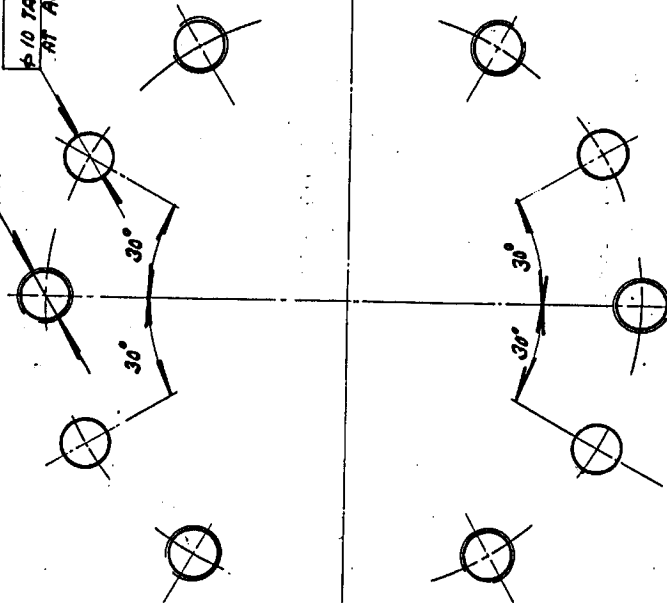
Φ 90 H6	20,000
Φ 80 H4	10,000
Φ 60 H6	10,000
Φ 45 H6	10,000
Φ 30 H7	10,000

M12-6 ANG-PC3 120
 AT 60°

4 HOLES FOR
 Φ 10 TRACER PIN
 AT ASSY



NO. OF TEETH 19
 MODULE 6
 PR. ANGLE 20°
 QUALITY AND TOL. ZONE 9C-D14.3867
 CORRECTION FACTOR -0.128
 WIDTH ACROSS 3 TEETH 45.888-0.237
 MATING GEAR NO. OF TEETH 38
 MATING GEAR DRG. NO. 171
 CENTRE DISTANCE



2	BUSH	BN CA7	13NC3 C-80 15:4432	1-M-08f-0887 49	2
1	SPUR GEAR				1

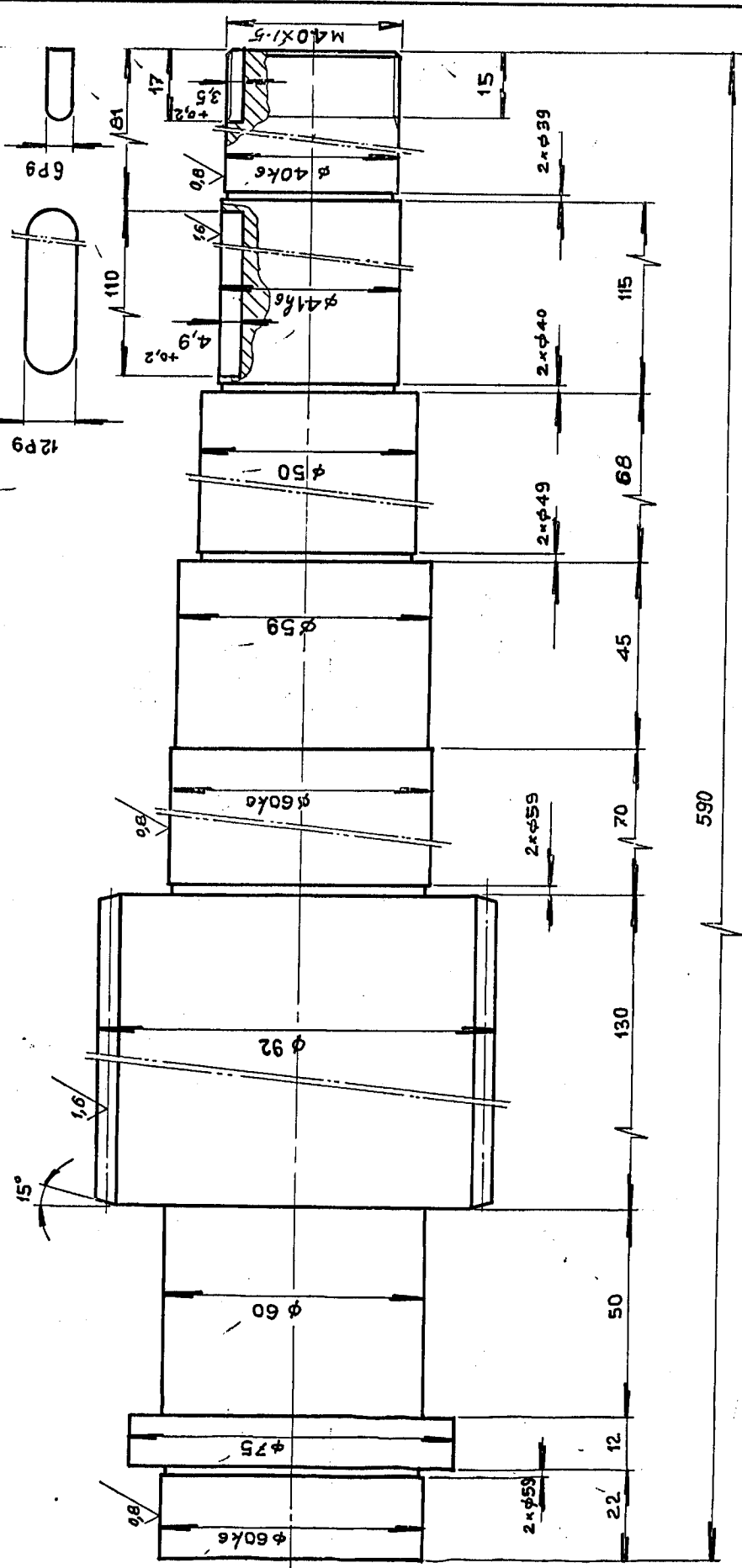
REV.	DESCRIPTION	REVISION	DATE
1	SPUR GEAR		17-4-88

SCALE: 1:1
 CHECKED: [Signature]
 APPROVED: [Signature]
 DATE: 1-3-80

REFERENCE: MACHINE-DEEP HOLE DRILLING
 TITLE: SPUR GEAR 197/4126
 TYPE: 60-6 FLB
 DRAWING NO. 3-M-08f-7814
 03
 SHEET NO. 1

CAUTION
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6 P9	-0.012	φ 60k6	+0.021
12 P9	-0.042	φ 40k6	+0.002
	-0.018	φ 40k6	+0.018
	-0.061	φ 41k6	+0.002
		φ 41k6	-0.000
		φ 41k6	-0.016



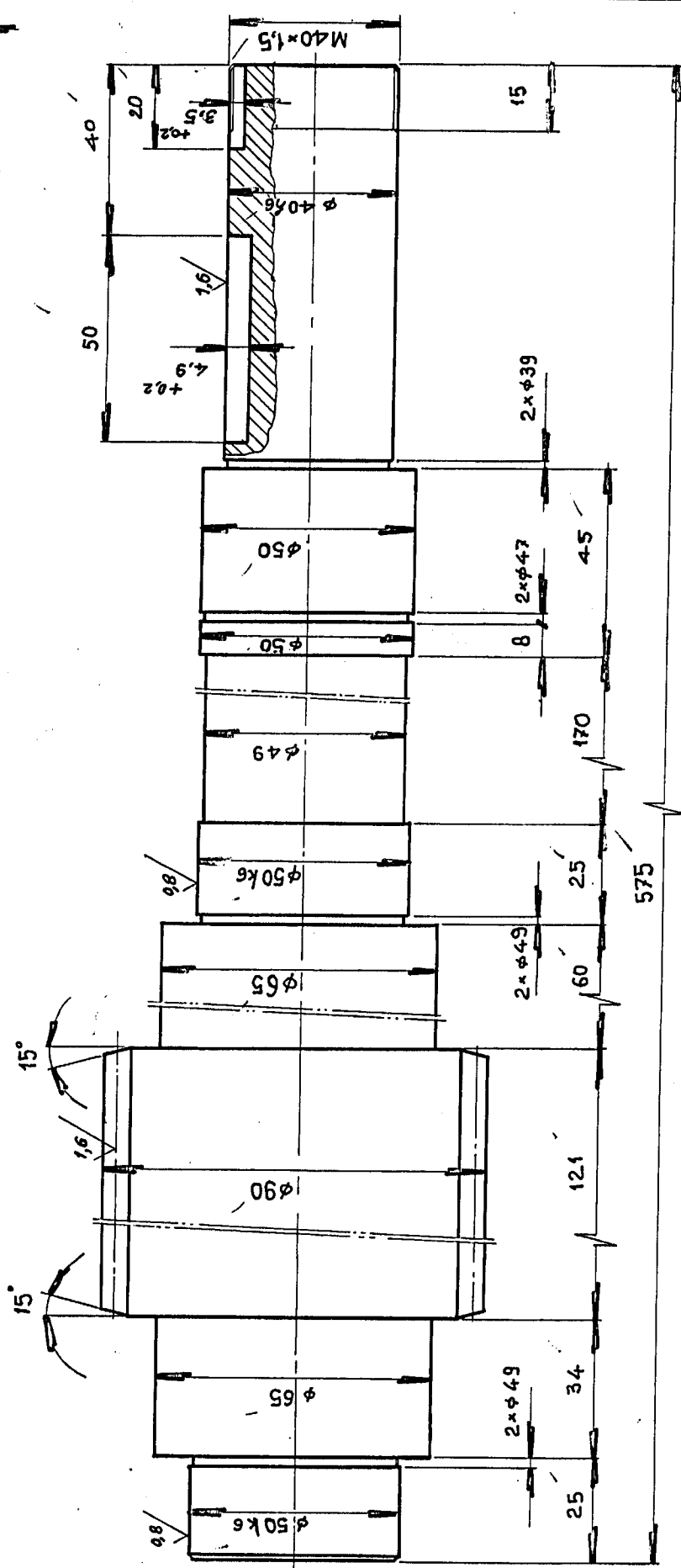
NO OF STARTS : SINGLE
 MODULE : 6
 PRESSURE ANGLE : 15°
 LEAD ANGLE : 4°, 17°
 HAND OF HELIX : L.H
 AXIAL PITCH : 18.84
 MATING GEAR NO. OF TEETH: 35
 MATING GEAR DRG NO : 4-M-08F-19450
 CENTRE DISTANCE : 14.5

NO OF LIECES	DESCRIPTION	SERIAL PRODUCT	FINAL MATERIAL	C45 IS:2073	15C8 IS:13283	1-M-08F-0997 12
REMARKS	DRAWN CHECKED APPROVED BY: OFFICER		REFERENCE	TOTAL NET WT. (KG)		DRAWING NO.
SCALE	DATE		ALTERNATIONS		SIGNATURE	
1:1	28-8-1982				INDEX	
MACHINE: DEEP HOLE BORING LATHE			DRAWING NO.		DATE	
TITLE:			TYPE 60-6FLB		NO. OF SHEETS	
WORM 1st φ 92			3-M-08F-8590		SHEET NO	

CAUTION

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12 P9	0.018	+0.018
6 P9	0.061	+0.009
	-0.012	-0.000
	-0.042	-0.016

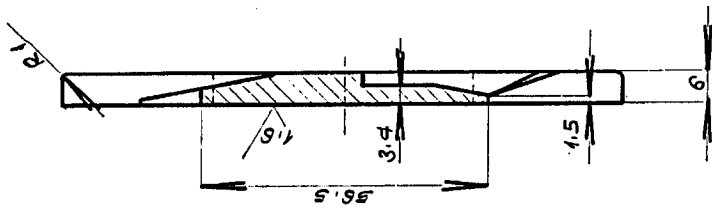


NOTE:

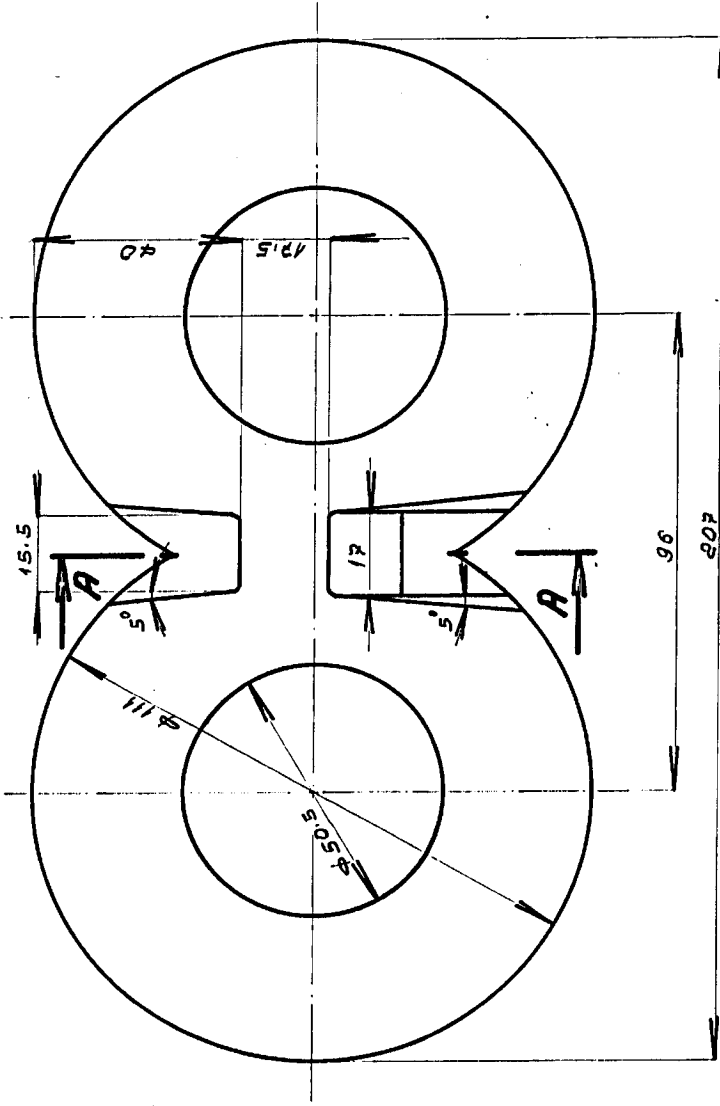
- SINGLE 5
- MODULE 15°
- PRESSURE ANGLE 3° 34'
- LEAD ANGLE L.H
- HAND OF HELIX 15.78
- AXIAL PITCH 40
- MATING GEAR NO OF TEETH 4-M.08F. 26536.
- MATING GEAR DRG NO. 140
- CENTRE DISTANCE

NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	C45	45CB	15.1073	15.10	1-M-08F-0987 11
REMARKS								
SCALE	DRAWN	CHECKED	APPROVED	STDS. OFFICER	DATE	REFERENCE	ALTERNATIONS	DATE
1:1	<i>A.S. Rainford</i>	<i>J. Bland</i>	<i>A. Bland</i>		6-9-1982			
MACHINE: DEEP HOLE BORING LATHE								
TITLE: WORM SHAFT 1st φ 90								
DRAWING NO. 60-6-FLB								
TYPE: 60-6-FLB								
NO. OF SHEETS: 1								
SHEET NO. 09								

3.2 / 1.6

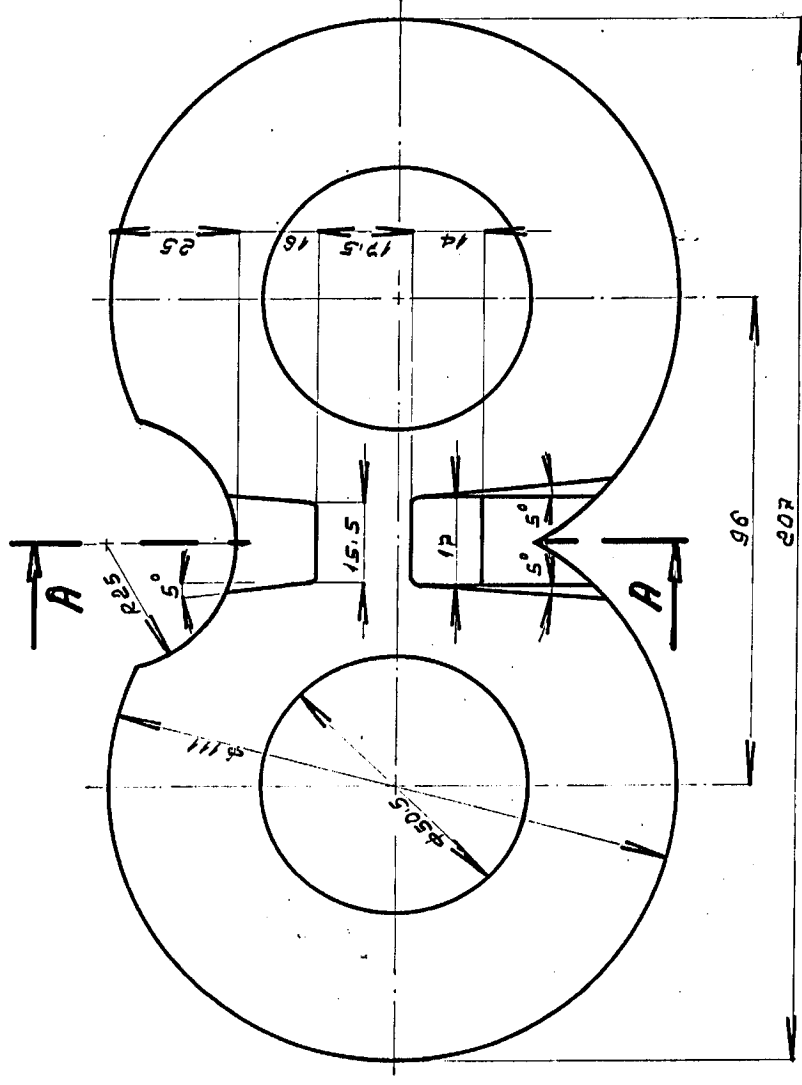


SECTION-AA



1	PCUSA 7	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP NET WT.	NET WT.	GROSS WT.	DRAWING NO.	ITEM NO.	
				78:28					3-M.081-2335 P		
REVISIONS		DRAWN		CHECKED		APPROVED		STDR. OFFICER		DATE	
SCALE		C. Campbell		K. H. To La. my.		D. B.				23 02 1984	
REFERENCE		MACHINE: DEEP HOLE BORING LATHE		TITLE:		DRAWING NO.		TYPE: 60-6-FLB		03	
LIVING PLATE		3-M.081-9010		NO. OF SHEETS:		SHEET NO.					

3-2 / 1-6



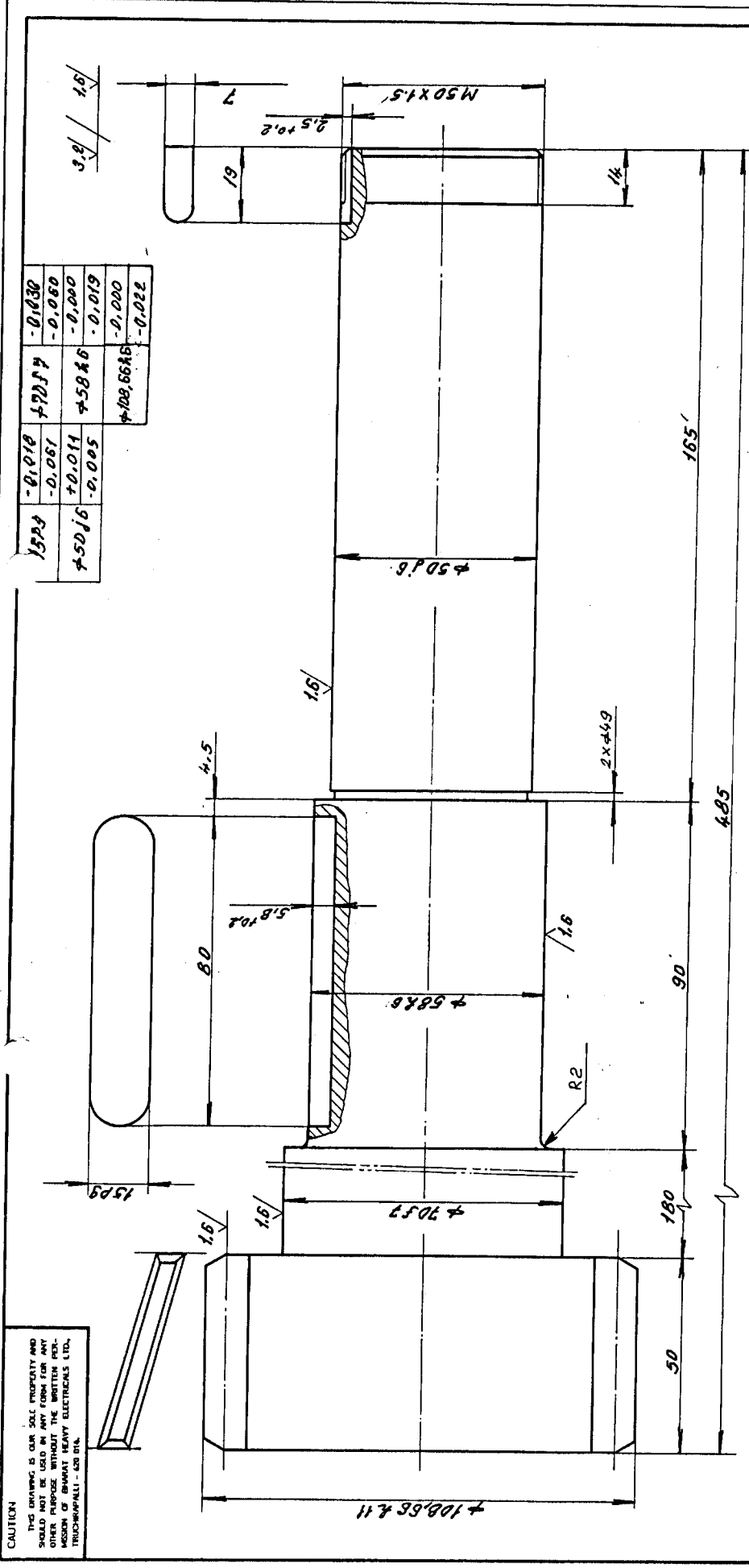
SECTION-AA

NO. OF SHEETS: 8		DRAWING NO. 3-M-085-9011	
INITIAL MATERIAL		TOTAL NET WT. (KGS)	
SCRAP SORT		NET WT.	
FINAL MATERIAL		ALTERATIONS	
DESCRIPTION		REFERENCE	
SEMI-PRODUCT		DATE	
DRAWN		STDS. OFFICER	
CHECKED		DATE	
APPROVED		SIGNATURE	
REMARKS		INDEX	
SCALE		DATE	
ACURAY TS:28		SIGNATURE	
MACHINE: DEEP HOLE BORING LATHE		DATE	
TYPE: 60.0-F1A		SIGNATURE	
DRAWING NO. 3-M-085-9011		DATE	
NO. OF SHEETS: 8		SIGNATURE	
TITLE: Lining Plate		DATE	
NO. OF SHEETS: 8		SIGNATURE	



3-M-085-9011
NO. OF SHEETS: 8

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1523	-0.018	+0.014	-0.030
	-0.061	-0.050	
450/6	+0.011	+0.000	
	-0.005	-0.019	
		-0.020	
		-0.022	

NO. OF TEETH : 13
 MODULE : 7
 PRESSURE ANGLE : 20°
 WIDTH ACROSS 2 TEETH : 32.423 -0.210
 CORRECTION FACTOR : —
 DILTY & TOL. ZONE : 9c DIN 3967
 MATING GEAR NO. OF TEETH : RACK
 MATING GEAR D.P.G. NO : —
 CENTRE DISTANCE : —
 R.A.M. OF HELIX : R.H
 HELIX ANGLE : 18°

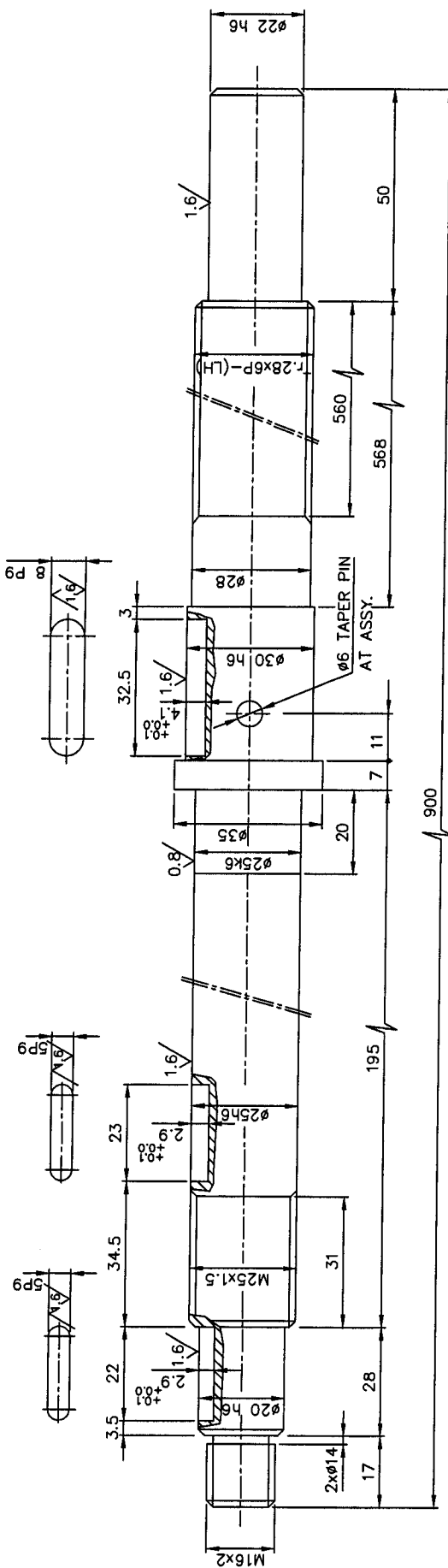
NOTE
 TOOTH PORTION FLAME HARDENED TO HR 5212

NO. OF PARTS	DESCRIPTION	SEM-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	FILM NO.
			13M3Cr80	IS : 44.32				4-M-08f-088714	
SCALE	DRAWN	CHECKED	APPROVED	SIGNS. OFFICER	DATE	REFERENCE	ALTERNATING	DATE	SIGNATURE
1:1					27.05-1985				
MACHINE: DEEP HOLE BORING LATHE									
TITLE: PINION SHAFT IV									
DRAWING NO. 3-M-08f-9308									
TYPE: 60-8.F.L.B									
NO. OF SHEETS: 137/40866									
SHEET NO. 03									

ALL DIMENSIONS ARE IN MM

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 TRICHYRAIPALIT - 620 014.

φ20 h6	-0.000	φ30 h6	-0.000
φ25 k6	-0.013	φ25 h6	-0.013
5 P9	+0.015	φ22 h6	-0.000
	+0.002	8 P9	-0.013
	-0.012		-0.015
	-0.042		-0.051



NOTE:-
CHAMFER ALL SHARP CORNERS TO 1/45°

FOR MATING NUT REF.DRG No.4M0BF03-28255&28256

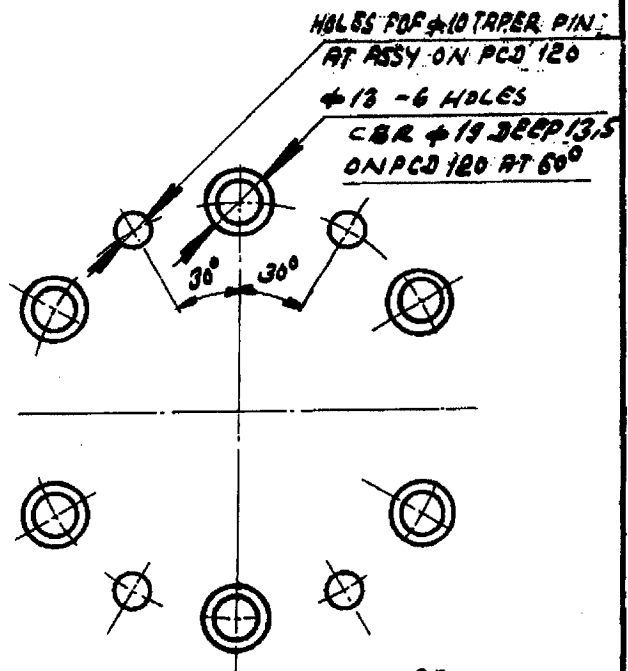
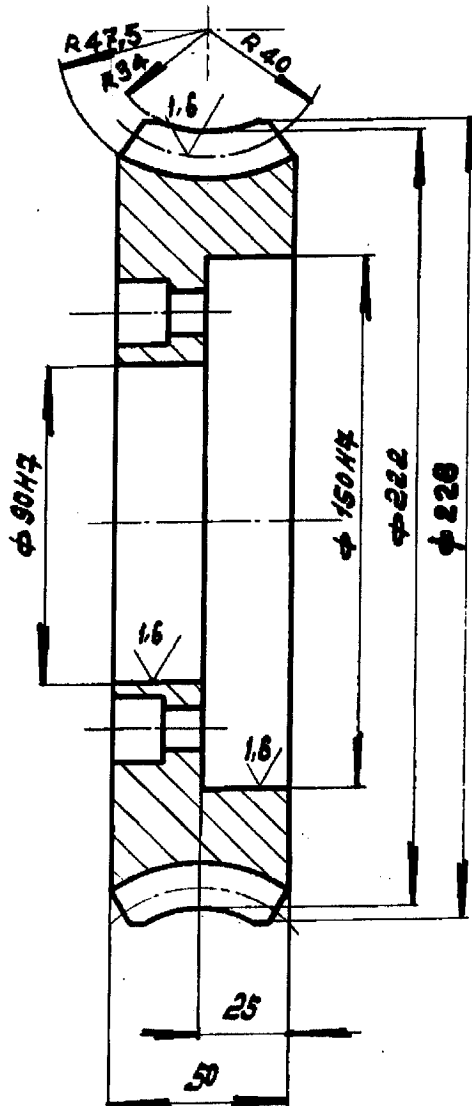
RODφ35x900 L	45 C8	IS: 72837	4.9
DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.
REFERENCE	ALTERATIONS	DCGN REF	DATE
SCALE	DRAWN	CHECKED	APPROVED
1:1	P.A.ROSS	R.RAMAMOORTHY	C.S.JAYASHEELAN
			DATE
			25-10.08
			MACHINE: CENTRE LATHE
			TYPE: PTC 400
			DRAWING No
			3M08F0313679
			Sheet No
			No of Sheets

CAUTION

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32 / 1.6

φ150 H7	+0,040
	+0,000
φ90 H7	+0,035
	+0,000



NO. OF TEETH	35
MODULE	6
PR. ANGLE	15°
HELIX ANGLE	4° 17'
HAND OF HELIX	L.H
WHALE DEPTH	-
MATING WORM NO. OF STARTS	SINGLE
MATING WORM. DRG. NO.	3-M-085-8590
CENTRE DISTANCE	145

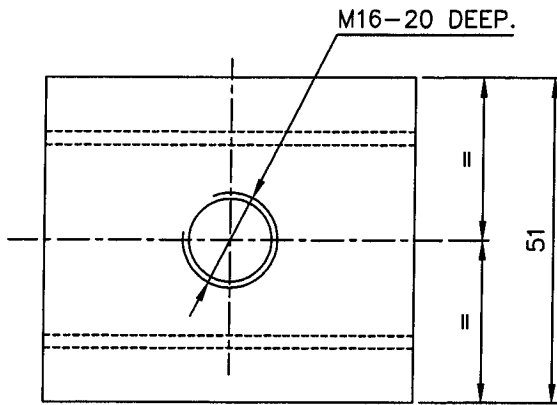
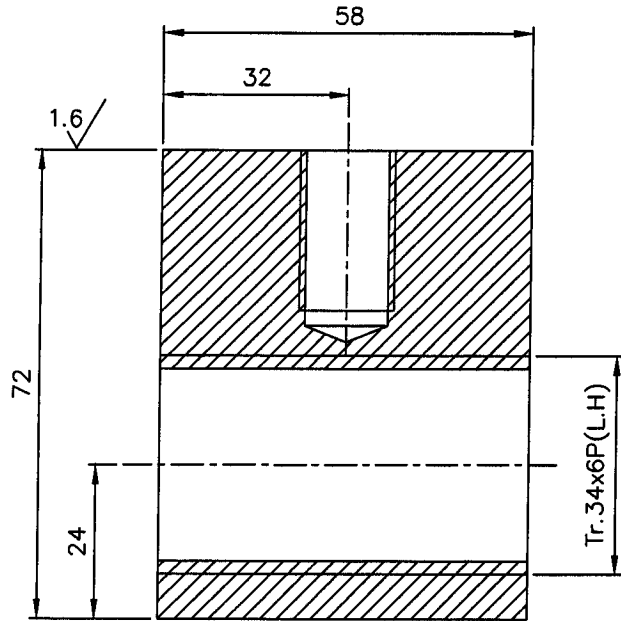
NO. OF PIECES		DESCRIPTION		SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING NO.	ITEM NO.	
					BN 2A3	PCU 277 IS: 20		1378		1-M-085-8590	48	
REMARKS								TOTAL NET WT (kg)				
SCALE	DRAWN				REFERENCE		ALTERATIONS		DATE		SIGNATURE	INDEX
	CHECKED											
	APPROVED											
	STDS. OFFICER											
	DATE											
MACHINE DEEP HOLE DRILLING LATHE						TYPE: 60-6PLB		INV. NO.				
TITLE:						DRAWING NO.		03				
						WORM WHEEL 35T/φ222		4-M-085-19450				
						NO. OF SHEETS		SHEET NO.				

INDEX NO. 39 - 607

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ALL DIMENSIONS ARE IN MM



NOTE: -

CHAMFER ALL SHARP CORNERS TO 1/45°

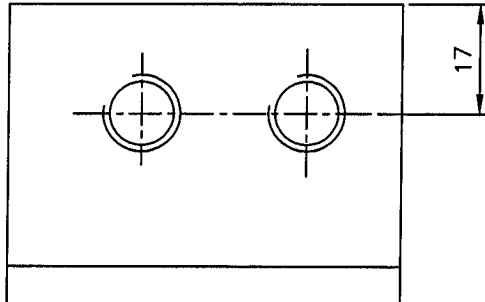
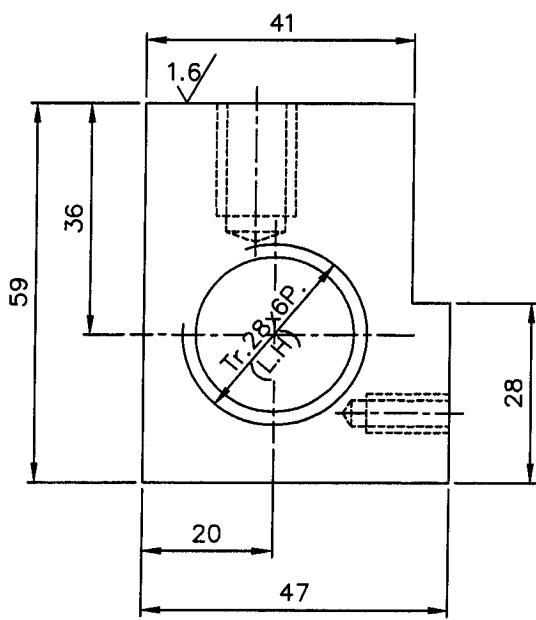
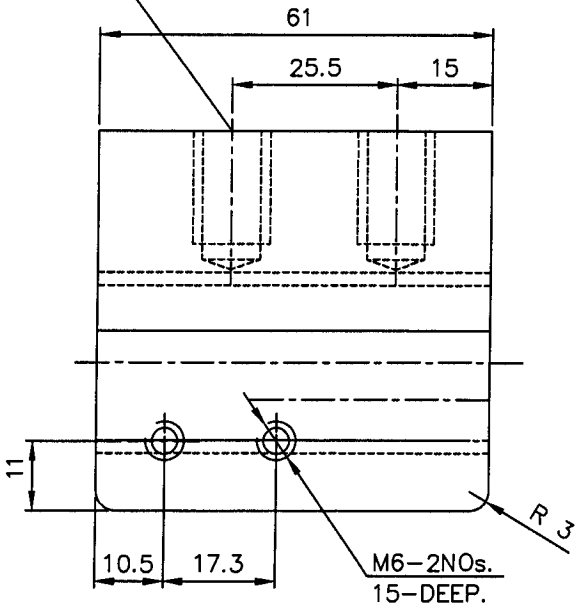
FOR MATING NUT REF.DRG No.3M08F0313680

	51x58x72	P Cu.Sn.7	IS: 28	1.8		
<input checked="" type="checkbox"/>						
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	R.RAMAMOORTHY				
	APPROVED	C.S.JAYASHEELAN				
	DATE	25-10-08				
	MACHINE: CENTRE LATHE	TYPE: PTC 400				
	TITLE:	BOX NUT Tr.34x6P (CROSS SLIDE ASSY.)		DRAWING No:		
				4M08F0328254		
		Sheet No:		No. of Sheets:		

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ALL DIMENSIONS ARE IN MM

M12-2NOs
20 DEEP.



3.2//1.6//

NOTE: -
CHAMFER ALL SHARP CORNERS TO 1/45°
FOR MATING NUT REF.DRG No.3M08F03-13679

	47x59x61	P Cu.Sn.7	IS: 28	1.8			
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.	
	REFERENCE:		ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX
SCALE 1:1	DRAWN	P.A.ROSS					
	CHECKED	R.RAMAMOORTHY					
	APPROVED	C.S.JAYASHEELAN					
	DATE	27-10-08					
	MACHINE: CENTRE LATHE			TYPE: PTC 400			
	TITLE: BOX NUT Tr.28x6P (LH). (CROSS SLIDE ASSY.)			DRAWING No:			
				4M08F0328255			
			Sheet No:		No. of Sheets:		