



429-002/A

BHARAT HEAVY ELECTRICALS LIMITED

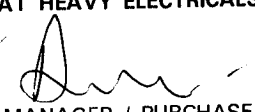
(A Government of India Undertaking)
 HIGH PRESSURE BOILER PLANT
 PURCHASE DEPARTMENT - FOSSIL BOILERS
 THIRUCHIRAPALLI - 620014
 TAMILNADU (INDIA)

Page
1/4
 PHONE : 2577629
 GRAMS : BHARATELEC
 FAX NO: 2520719
 E-mail: srchandran@bheltry.co.in
 Web:

	Enquiry No	Enquiry Date	Due Date for Quotation
	2661400714 - 55	26.09.2014	25.10.2014
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	7504B1403400 GEAR SEGMENT AS PER DRG. NO. 4M-04B-14-6470 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 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	30.01.15
20	7504B1003900 HELICAL GEAR AS PER DRG. NO. 4M-04B-10-6946 NOTE: SL.NO. 20 to 40 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	4.000	4.00	30.01.15
30	7504B1004000 HELICAL GEAR AS PER DRG. NO. 4M-04B-14-6899	NO	4.000	4.00	30.01.15
40	7504B1004100 HELICAL GEAR AS PER DRG. NO. 4M-04B-10/14-6900	NO	4.000	4.00	30.01.15
50	7504B1004200 HELICAL GEAR AS PER DRG. NO. 4M-04B-10/14-6897 NOTE: SL.NO. 50 AND 60 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	4.000	4.00	30.01.15

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,



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2661400714 / 26.09.2014

60	7504B1004300 HELICAL GEAR AS PER DRG. NO. 4M-04B-14-6898-01	NO	4.000	4.00	30.01.15
70	7504B1004400 HELICAL GEAR AS PER DRG. NO. 4M-04B-10/14-6901 NOTE: SL.NO. 70 AND 80 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	4.000	4.00	30.01.15
80	7504B1004500 HELICAL GEAR AS PER DRG. NO. 4M-04B-14-6902-01	NO	4.000	4.00	30.01.15
90	7504B1402900 PINION AS PER DRG. NO. 4M-04B-14-14833-01 NOTE: SL.NO. 90 AND 100 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	4.000	4.00	30.01.15
100	7504B1402200 SPUR GEAR AS PER DRG. NO. 4M-04B-14-14834-01	NO	4.000	4.00	30.01.15
110	7504B1403500 SPUR GEAR AS PER DRG. NO. 4M-04B-14-21691	NO	4.000	4.00	30.01.15
120	7504B1402700 SPUR GEAR AS PER DRG. NO. 4M-04B-14-22671-01 NOTE: SL.NO. 120 TO 140 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	4.000	4.00	30.01.15
130	7504B1402800 SPUR GEAR AS PER DRG. NO. 4M-04B-14-22672-01	NO	4.000	4.00	30.01.15
140	7504B1402600 SPUR GEAR AS PER DRG. NO. 4M-04B-14-23523-01	NO	4.000	4.00	30.01.15
150	7504B1403600 SPUR GEAR AS PER DRG. NO. 4M-04B-14-27762	NO	4.000	4.00	30.01.15
160	7504B1400300 MOTOR PINION AS PER DRG.NO.	NO	4.000	4.00	30.01.15

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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**

For


MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,



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2661400714 / 26.09.2014

Sl. No.	Description	QTY	Rate	Amount	Due Date
170	4M-04B-10-6151 NOTE: SL.NO. 160 AND 170 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY. 7504B1400400 SPUR GEAR AS PER DRG.NO. 4M-04B-10/12-6153	NO	4.000	4.00	30.01.15
180	7512B3700800 SPIRAL BEVEL GEAR AS PER DRG NO: 3M-12B-37-14131 NOTE: SL.NO. 180 AND 190 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	15.000	15.00	30.01.15
190	7512B3700900 SPIRAL BEVEL GEAR AS PER DRG NO: 3M-12B-37-14132	NO	15.000	15.00	30.01.15
200	7510A6300400 BEVEL GEAR AS PER DRG. NO. 4M-10A-63-29597 NOTE: SL.NO. 200 AND 210 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	3.000	3.00	30.01.15
210	7510A6300500 BEVEL GEAR AS PER DRG. NO. 4M-10A-63-29598	NO	3.000	3.00	30.01.15
220	7501B0500300 BEVEL GEAR AS PER DRG.NO. 4M-01B-06-06055 NOTE: SL.NO. 220 TO 280 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	8.000	8.00	30.01.15
230	7501B0602200 BEVEL GEAR AS PER DRG.NO. 4M-01B-06-06057	NO	8.000	8.00	30.01.15
240	7501B0600200 BEVEL GEAR AS PER DRG. NO. 4M-01B-04/06-06056-01	NO	16.000	16.00	30.01.15
250	7501B0500200 SPUR GEAR AS PER DRG. NO. 3M-01B-06-02536	NO	4.000	4.00	30.01.15

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

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MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,



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PURCHASE DEPARTMENT - FOSSIL BOILERS
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2661400714 / 26.09.2014

260	7501B0500700 SHAFT AS PER DRG NO. 3M-01B-06-02540	NO	10.000	10.00	30.01.15
270	7501B0605800 SPLINED SHAFT AS PER DRG. NO. 3M-01B-06-2539	NO	8.000	8.00	30.01.15
280	7501B0601600 SPUR GEAR AS PER DRG. NO. 4M-01B-06-6054	NO	8.000	8.00	30.01.15

General Note:

PLEASE SUBMIT YOUR OFFER IN "TWO PART BID SYSTEM"
AS PER ANNEXURE ENCLOSED

ENCLOSURES:

ANNEXURE II,III,IV,V,VI,VII & DRAWINGS


Enclosures:

"LD clause has to be confirmed without fail."

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

For


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>

Bharat Heavy Electricals Limited, Tiruchirappalli -620 014
MM: CP & SP
Annexure For Techno Commercial Bid
 Check List - to be filled and submitted along with Technical Bid

Annexure-III

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
MODEL PRICE BID FORMAT FOR INDIAN BIDDERS**

CAPITAL PURCHASE

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 without 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 with 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)

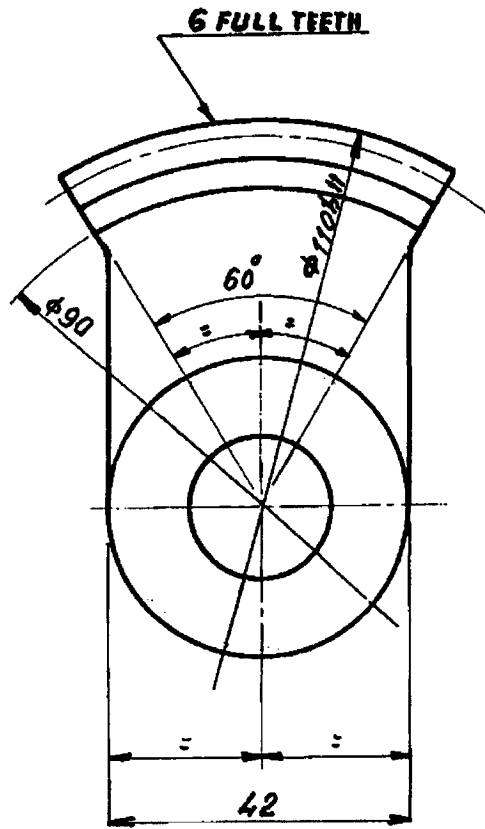
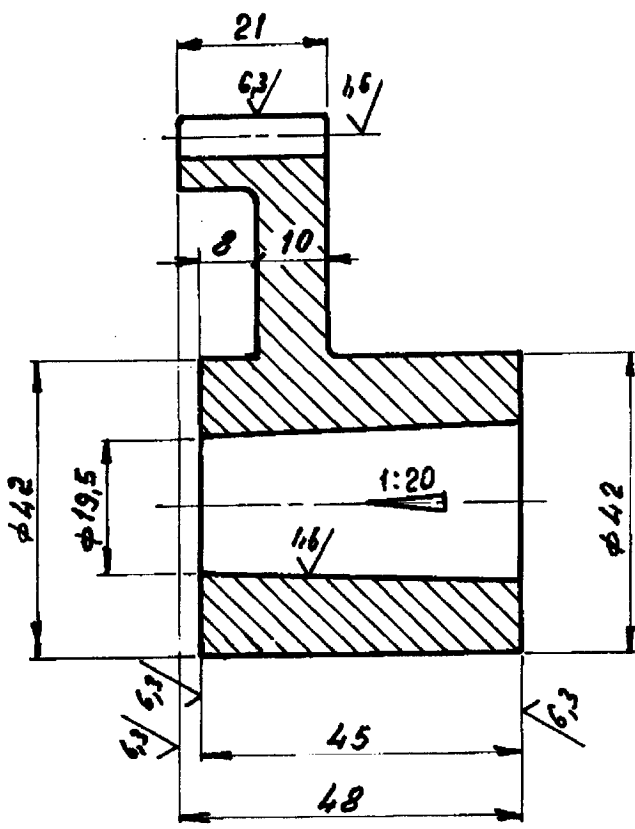
Name -

Membership number -

Seal of Chartered Accountant

10

$\sqrt{6.3}$ / $\sqrt{1.6}$ /
 $\phi 110 \pm 11$ -0.000
 -0.220



CHAMFER SHARP CORNERS TO 1/45°

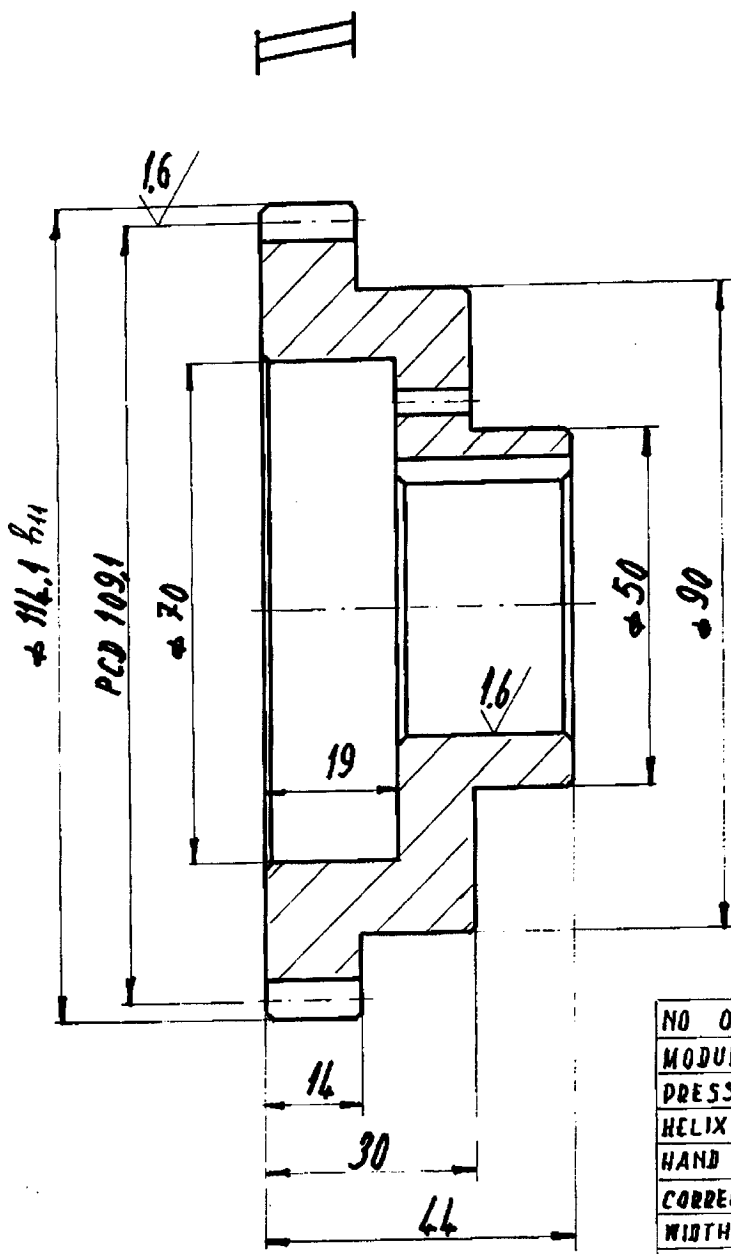
NO OF TEETH	42 FOR 360°
MODULE	2,5
PRESSURE ANGLE	20°
QUALITY TOL. ZONE	9C. DIN. 3269
WIDTH ACROSS 5 TEETH	36,68 = 0,158 0,210
MATING GEAR. NO OF TEETH	RACK
MATING RACK DRG. NO.	-
CENTRE DISTANCE	-

FG. 220 IS:210

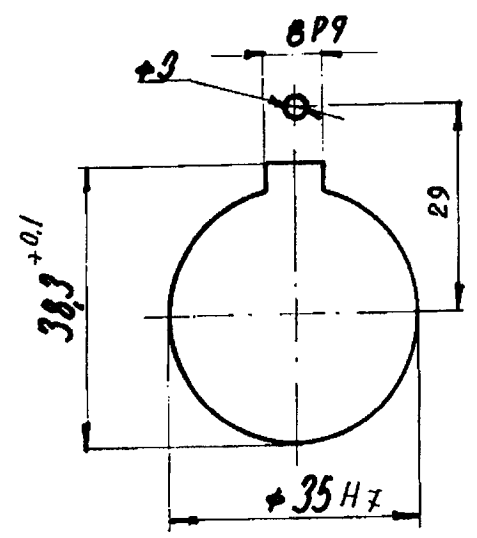
		CAST IRON Gr. 20; IS:20		0,5					
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt(kg)	GROSS Wt(kg)	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET Wt (kg)					
SCALE	DRAWN BY	REFERENCE		ALTERATIONS		DATE	SIGNA- TURE	ALTERATION INDEX	
1:1	<i>H. B. Sanyal</i>								
	CHECKED BY								
	APPROVED BY								
	STDS. OFFICER								
	DATE	3-11-70.							
MACHINE RADIAL DRILLING		TITLE :		TYPE: RM 65		INV. NO.			
TIRUCHY		GEAR SEGMENT $\phi 110/42$. (DRILL HEAD CLAMPING)		DRAWING NO.		4-M-046-6470			
				NO. OF SHEETS		SHEET NO :			

20

32/46



φ114.16H	-0.000
	-0.220
φ35H7	+0.025
	+0.000
BP9	-0.015
	-0.051

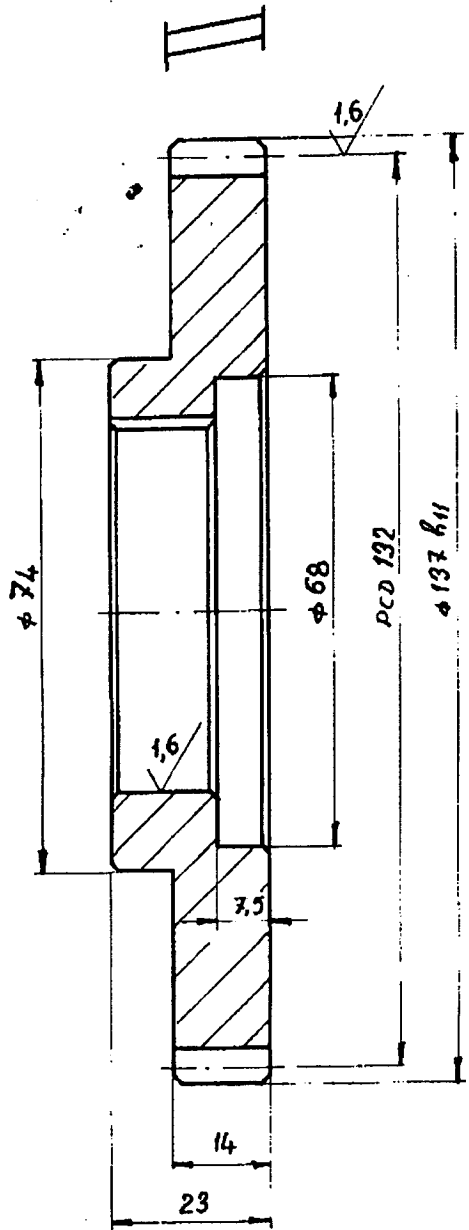


CHAMFER CORNERS TO 1/45°
CASE HARDEN TO HRC 55±2
CASE DEPTH 0.8MM

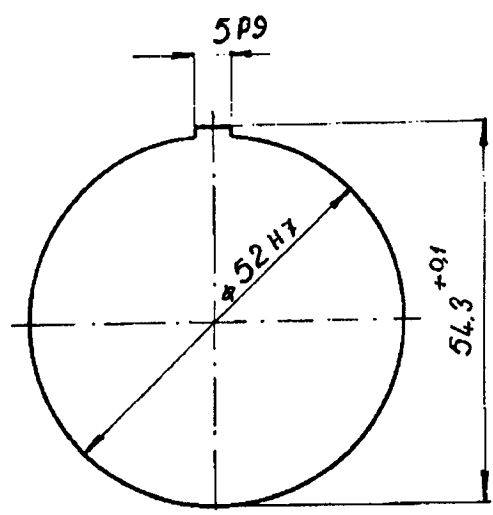
NO OF TEETH	43
MODULE	2.5
PRESSURE ANGLE	20°
HELIX ANGLE	10°
HAND OF HELIX	L.H.
CORRECTION FACTOR	-0.25
WIDTH ACROSS GT	41.428 - 0.079
QUALITY & TOL. ZONE	9a-JIN 3967
MATING GEAR NO OF TEETH	23
DRG. NO	4.M. 04b. 6900
CENTRE DISTANCE	83.235

		SM-CH4							
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET WT (kg)					
SCALE	DRAWN BY	REFERENCE		ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX		
1:1	CHECKED BY								
	APPROVED BY								
	STDS. OFFICER								
	DATE	12.3.21							
MACHINE RADIAL DRILLING				TYPE: RM 52 & 62		INV. NO.			
TITLE: HELICAL GEAR 43T/φ116.1 (ELEVATING DRIVE) R.56-74-306				DRAWING NO.		10			
TIRUCHY				4-M-04b-6946		SHEET NO:			
				NO. OF SHEETS					

3.2/1.6



φ 132 h11	-0.000
	-0.250
φ 52 H7	+0.030
	+0.000
5P9	-0.012
	-0.042



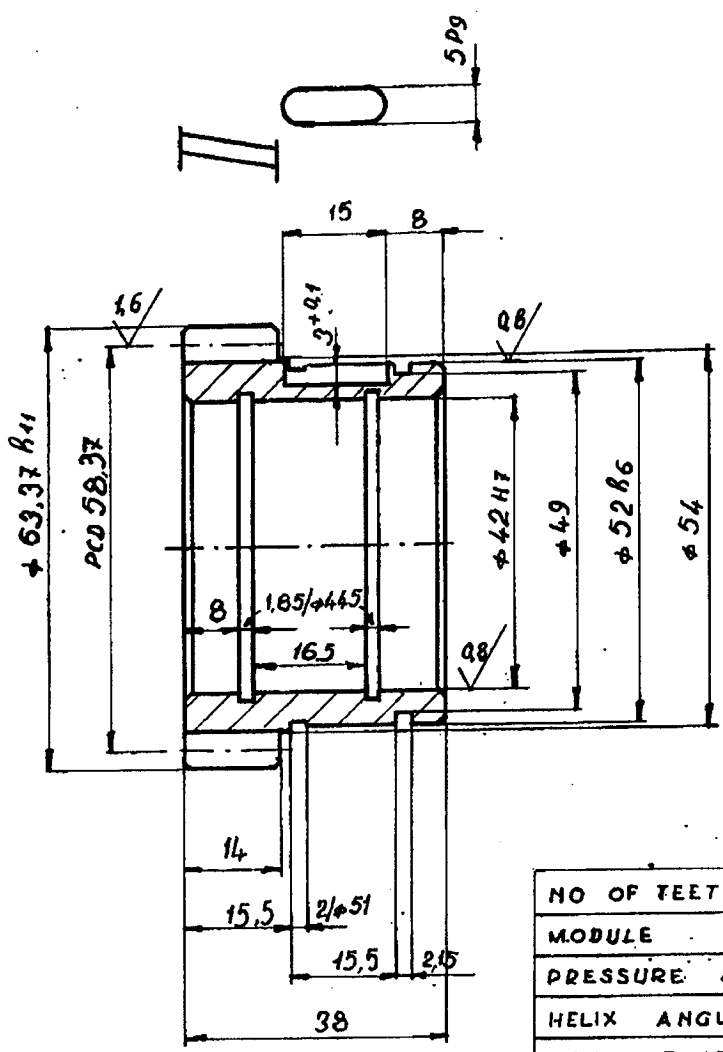
CHAMFER CORNERS TO 1/16.5°
CASE HARDEN TO HRC 56 ± 2
CASE DEPTH 0.8MM

NO. OF TEETH	52
MODULE	2.5
PRESSURE ANGLE	20°
HELIX ANGLE	10°
HAND OF HELIX	LH
CORRECTION FACTOR	-
WIDTH ACROSS 6T	49.875 ± 0.070
QUALITY & TOL. ZONE	9C DIN 3967
MATING GEAR NO OF TEETH	23
MATING GEAR DRG. NO	4-M-04b-6980
CENTRE DISTANCE	95.185

		DM-CH4									
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT (KG)	GROSS WT (KG)	DRAWING NO.	ITEM NO.		
REMARKS				TOTAL NET WT (kg)							
SCALE	DRAWN BY	REFERENCE		ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX				
1:1	CHECKED BY										
	APPROVED BY										
	STDS. OFFICER										
	DATE	2.9.71									
MACHINE RADIAL DRILLING				TYPE: RM 52 & 62		INV. NO.					
TITLE 1				DRAWING NO.		14					
HELICAL GEAR 52T/φ132				4-M-04b.6899							
(ELEVATING DRIVE)				NO. OF SHEETS		SHEET NO 1					
R 56-74-303.											
TIRUCHY											

42

3.2 / 1.6 / 0.8



φ6337H11	-0.000
	-0.190
φ52 H6	-0.000
	-0.019
φ42 H7	+0.025
	+0.000
5P9	-0.012
	-0.042

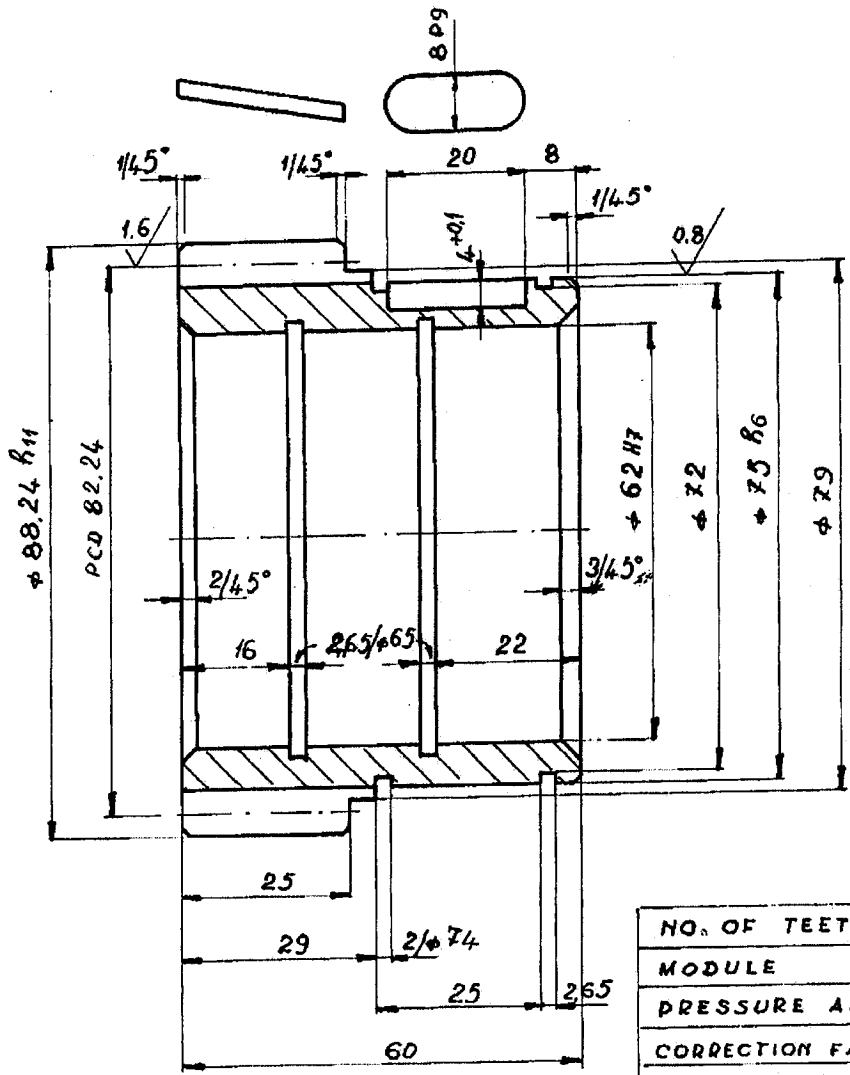
NO OF TEETH	23
MODULE	2,5
PRESSURE ANGLE	20°
HELIX ANGLE	10°
HAND OF HELIX	R.H.
CORRECTION FACTOR	-
WIDTH ACROSS 3T.	19,293 - 0.199
	- 0.185
QUALITY & TOL. ZONE.	9c DIN 3967.
MATING GEAR NO OF TEETH	52/43T.
MATING GEAR DRG. NO.	4-M-046-6899
	4-M-046-6946
CENTRE DISTANCE.	85,185 / 83,735

CHAMFER CORNERS TO 1/45°
CASE HARDENED TO HRC 60 ±2
CASE DEPTH 0.8.

		BM-CHI							
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET WT (kg)					
SCALE	DRAWN BY	REFERENCE		ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX		
1:1	CHECKED BY								
	APPROVED BY								
	SYDS. OFFICER								
	DATE	2.3.71							
MACHINE RADIAL DRILLING				TYPE: RM 52 262		INV. NO.			
TITLE: HELICAL GEAR 23T/φ63.37 (ELEVATING DRIVE) P56-74-302A.				DRAWING NO.		10/14			
TIRUCHY				4-M-046-6900		NO. OF SHEETS SHEET NO 1			

50


3.2 / 1.6 / 0.8



φ 88.24 H11	-0.000
-0.220	
φ 62 H7	+0.030
+0.000	
φ 75 h6	-0.000
-0.019	
8 P9	-0.015
	-0.051

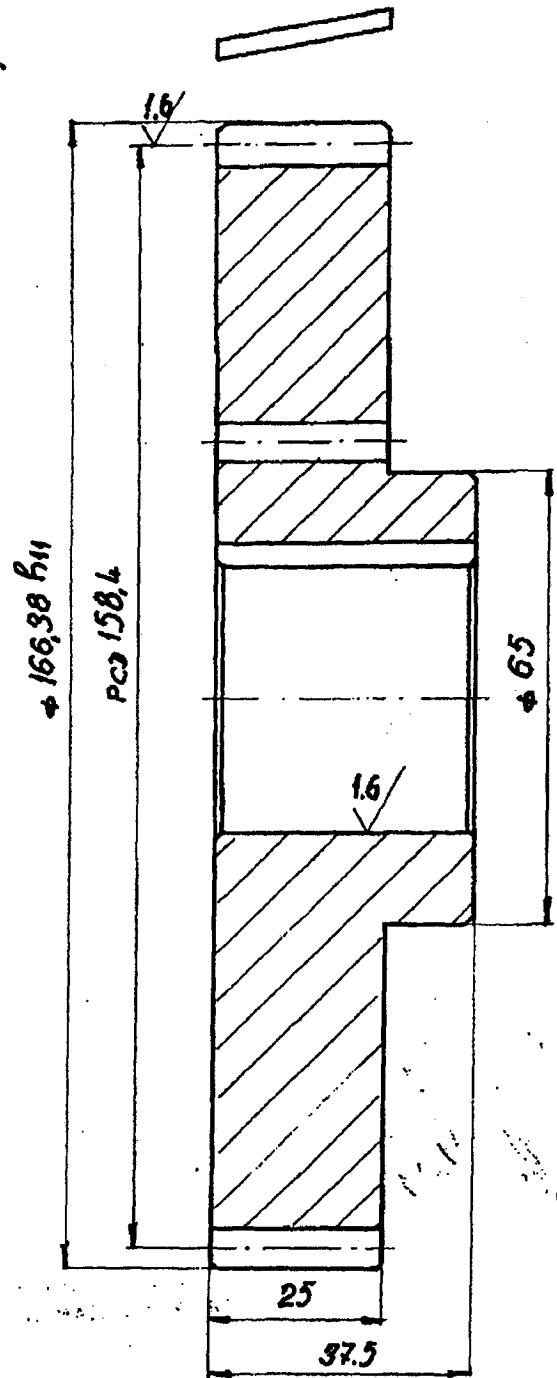
NO. OF TEETH	27
MODULE	3
PRESSURE ANGLE	20°
CORRECTION FACTOR	-
HELIX ANGLE	10°
HAND OF HELIX	R.H.
WIDTH ACROSS 4 T.	32.171 - 0.141
QUALITY & TOL. ZONE	9C DIN 3967
MATING GEAR NO OF TEETH.	52T/51T.
MATING GEAR DRG. NO.	4M-04B10-06898 01
CENTRE DISTANCE.	121.5

CASE HARDENED TO HRC 58^{±2}
CASE DEPTH 0.8

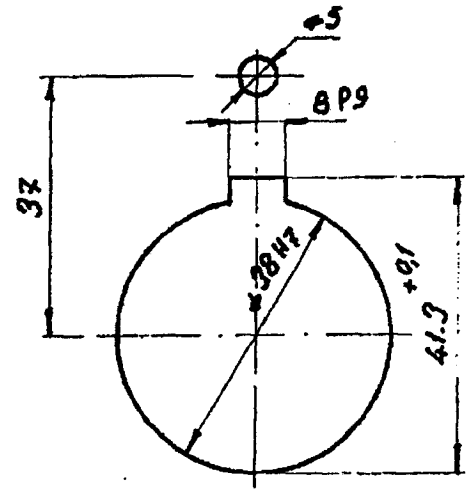
		B.M. CH 1							
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT (KG)	GROSS WT (KG)	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET WT (KG)					
SCALE 1:1	DRAWN BY	REFERENCE		ALTERATIONS		DATE	SIGNATURE	ALTERATION INDEX	
	CHECKED BY			MATING DRG.No.		25.09.14	G.T	01	
	APPROVED BY			4M-04B10-06898					
	STDS. OFFICER			WAS					
DATE	2.3.21		4-M-04B-6808						
MACHINE RADIAL DRILLING				TYPE RM 55 & 65		INV. NO.		RN	
TITLE :				4-M-04B10-06897 01					
 HELICAL GEAR 27T/φ88.24 (ELEMENTING DRIVE) R 56-75-302A.									

62

32/16/



$\phi 166.38 \text{ H}11$	-0.000
	-0.250
$\phi 65 \text{ H}7$	+0.025
	+0.000
B P9	-0.013
	-0.051



NO OF TEETH	52
MODULE	3
PRESSURE ANGLE	20°
HELIX ANGLE	10°
HAND OF HELIX	L.H.
CORRECTION FACTOR	+0.33
WIDTH ACROSS TT.	60.52 -0.132
QUALITY & TOL. ZONE	9e DIN 3967
MATING GEAR NO OF TEETH	27
MATING GEAR DRG. NO	4.M.04b.6897
CENTRE DISTANCE	121.5.

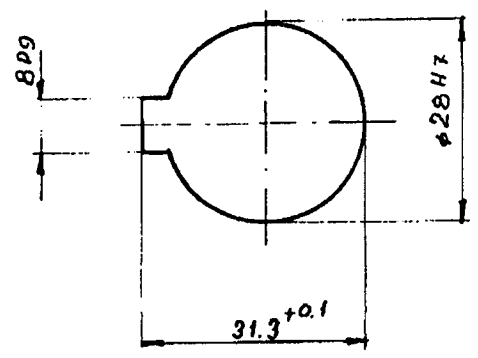
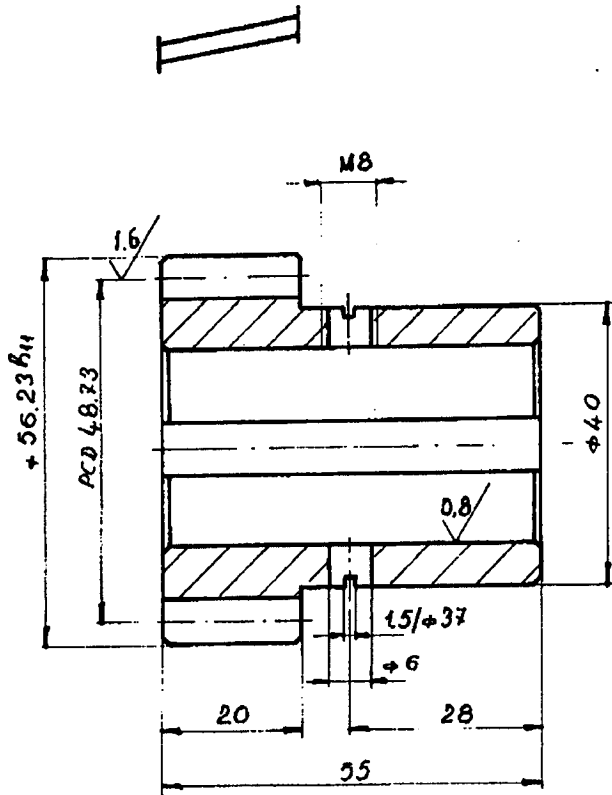
CHAMFER CORNERS TO 1/45°

01

$\phi 166.38 \times 37.5$		45C8	IS:2004	3.88					
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET WT (kg)					
SCALE	DRAWN BY	CHECKED BY	APPROVED BY	STDE. OFFICER	DATE	SIGNATURE	ALTERATION INDEX		
1:1					2.3.79				
MACHINE RADIAL DRILLING				TYPE: RM 55 & 65		INV. NO.			
TIRUCHY				DRAWING NO.		4.M.04b.6898			
HELICAL GEAR 52T/ $\phi 166.38$				NO. OF SHEETS		SHEET NO: 01			
(ELEVATING DRIVE)				R56-75-304					

32/16 08/

+56.23 h11	-0.000
	-0.190
+28 H7	+0.021
	+0.000
B P9	-0.015
	-0.051



CHAMFER CORNERS TO 45°
CASE HARDENED TO HRC 60 ± 2
CASE DEPTH 0.8.

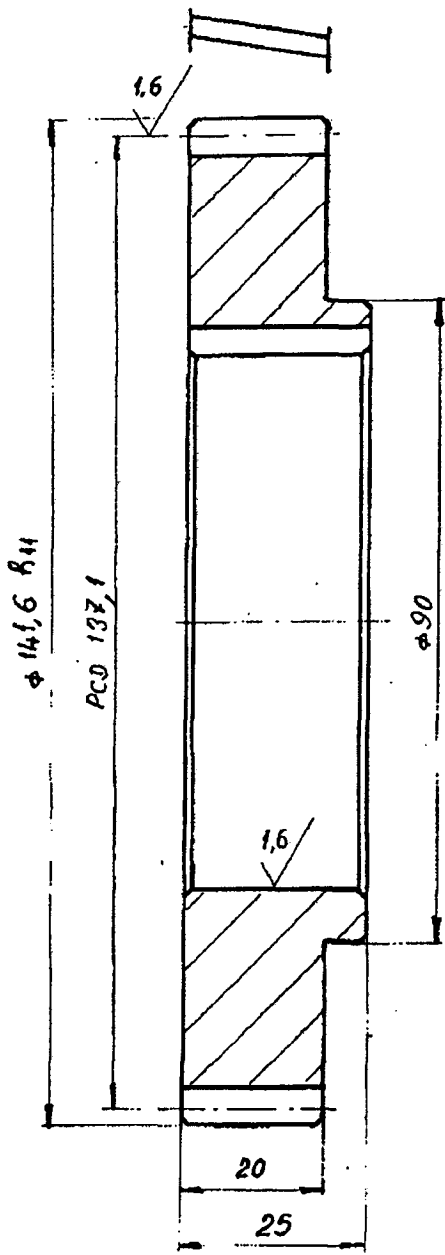
NO. OF TEETH	16
MODULE	3
PRESSURE ANGLE	20°
HELIX ANGLE	10°
HAND OF HELIX	L.H.
CORRECTION FACTOR	+0.25
WIDTH ACROSS 2T	14.5 -0.063 -0.105
QUALITY & TOL. ZONE	9@.DIN3967
MATING GEAR NO OF TEETH	45 T
MATING GEAR DRG. NO	4.M.046-6902
CENTRE DISTANCE	92.90

		BM. CH 1									
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING NO.	ITEM NO.		
REMARKS				TOTAL NET WT (kg)							
SCALE	DRAWN BY	REFERENCE		ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX				
1:1	CHECKED BY										
	APPROVED BY										
	STDS. OFFICER										
	DATE	2.3.71									
MACHINE RADIAL DRILLING				TYPE: RM 55 & 55.		INV. NO.					
TITLE 1				DRAWING NO.		10/14					
HELICAL GEAR 16T/φ56.23				4-M-046-6901							
(ELEVATING DRIVE)											
(R56-75-300)				NO. OF SHEETS		SHEET NO 1					

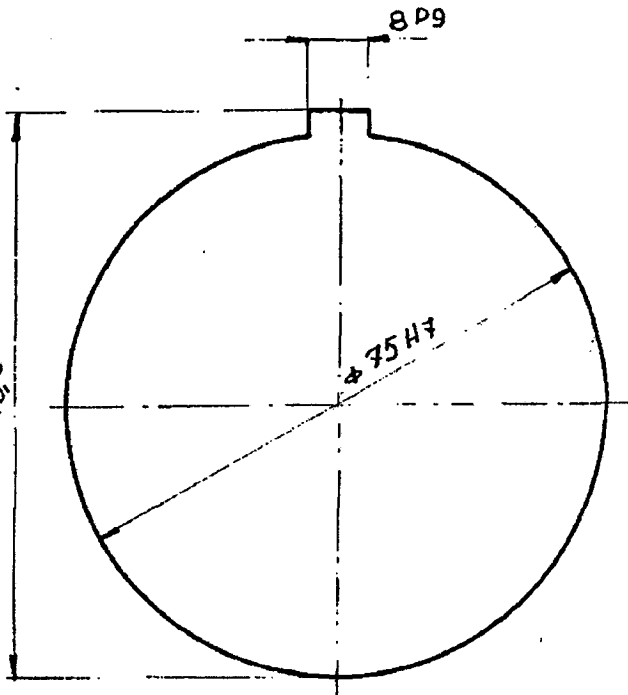


80

3.2 / 1.6



	$\phi 141.6\text{ RH}$	-0.000
		-0.250
$\phi 75\text{ H7}$		+0.030
		+0.000



NO OF TEETH	45
MODULE	3
PRESSURE ANGLE	20°
HELIX ANGLE	10°
HAND OF HELIX	RH.
CORRECTION FACTOR	-0.25
WIDTH ACROSS ST.	50.146 ^{-0.030} -0.132
QUALITY & TOL.ZONE	9e.DIN3967
MATING GEAR NO OF TEETH	16T
MATING GEAR DRG.NO	4-M.046.6901
CENTRE DISTANCE	92.90

CHAMFER CORNERS TO 1/4 R

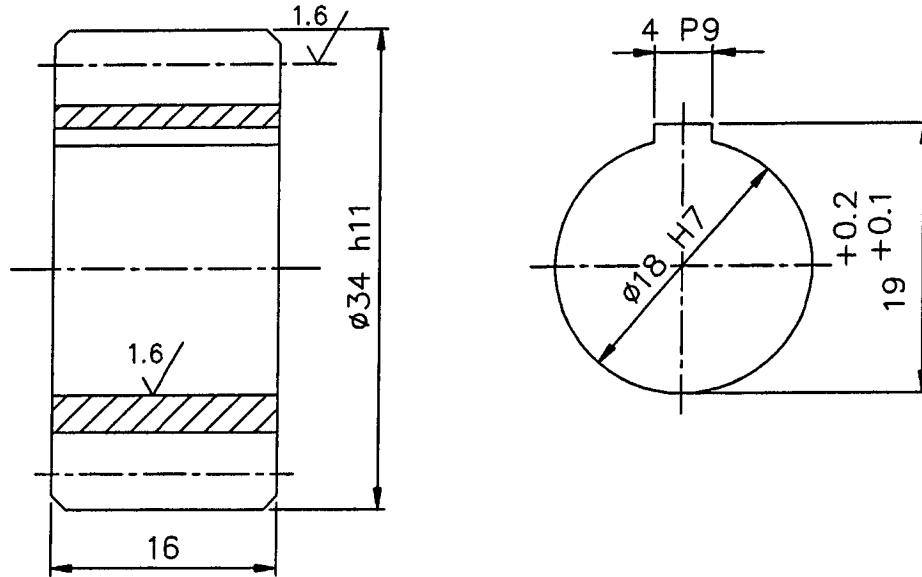
$\phi 141.6 \times 25t$		45C8	19:2004	1.61			
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT (KG)	GROSS WT (KG)
REMARKS				TOTAL NET WT (KG)			
SCALE	DRAWN BY	REFERENCE	ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX	
1:1	<i>[Signature]</i>		WT. ADDED	19.06.13	KR	01	
	CHECKED BY						
	APPROVED BY						
	STDS. OFFICER						
	DATE	2.3.77					
MACHINE RADIAL DRILLING			TYPE: RM 55 & 65		INV. NO.		
TITLE: HELICAL GEAR 45T / $\phi 141.6$ (ELEVATING DRIVE) 256-75-301			DRAWING NO.		4-M-046-6902-01		
TIRUCHY			NO. OF SHEETS		SHEET NO 1		

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ALL DIMENSIONS ARE IN MM

ø34h11	-0.000	4P9	-0.012
	-0.160		-0.042
ø18H7	+0.018		
	+0.000		

3.2//1.6
✓/✓



NO.OF TEETH	11
MODULE	2.5
PRESSURE ANGLE	20°
WIDTH ACROSS 2 TEETH	11.968 -0.127 -0.169
CORRECTION FACTOR	+0.3
QLTY.&TOL.ZONE	9c DIN 3967
MATING GEAR NO.OF TEETH	22
MATING GEAR DRAWING NO:	4M-04B14-14834
CENTRE DISTANCE	42

NOTE:-

CHAMFER SHARP CORNER'S TO 0.5/45°.

HARDENED TO HRC 40^{±2}

		ø34x16t	55c8	IS: 5517	0.07		
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.	
	REFERENCE:	ALTERATIONS:		DCN REF	DATE	SIGN.	INDEX
SCALE 2:1	DRAWN/TCO	N.MANOJ					
	CHECKED						
	APPROVED						
	DATE	27/01/76-25/09/08					
	MACHINE:	RADIAL DRILLING		TYPE:	RM 65.		
	TITLE:	PINION 11T./ø34 (DRILLING HEAD TRAVERSING)		DRAWING No:	4M04B1 414833 01		
		Sheet No:			No. of Sheets:		

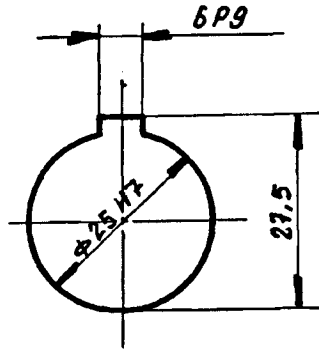
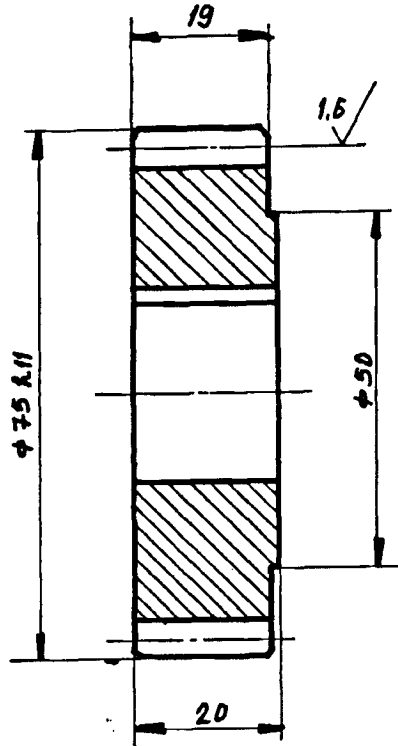
110

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TIRUCHIRAPALLI-14

32 / 16

6 P9	-0.012
	-0.042
φ25 H7	+0.021
	+0.000
φ75 h11	+0.000
	-0.190



NO. OF TEETH :- 28
 MODULE :- 2.5
 PRESSURE ANGLE :- 20°
 CORRECTION FACTOR :- —
 WIDTH ACROSS 4 TEETH :- 26.8112^{-0.141}_{-0.188}
 QUALITY & TOL. ZONE :- 9C DIN 3967
 MATING GEAR NO. OF TEETH :-
 CENTRE DISTANCE :-

C: 45
 IS: 2073

NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt (kg)	GROSS Wt (kg)	DRAWING NO.	ITEM NO.
---------------	-------------	--------------	----------------	------------------	------------	-------------	---------------	-------------	----------

REMARKS				TOTAL NET Wt (kg)					
SCALE	DRAWN	REFERENCE		ALTERATIONS		DATE	SIGNATURE	INDEX	
1:1	CHECKED								
	APPROVED								
	STDS. OFFICER								
	DATE	21.06.1984							

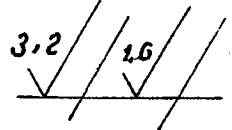
	MACHINE	RADIAL DRILLING	TYPE:	RM: 65	INV. NO.	
	TITLE:	SPUR GEAR 28T/φ75		DRAWING NO.	4-M-4b-21691 ¹⁴	
		[M.Y.B. LOCKING UNIT]	NO. OF SHEETS		SHEET NO.	

INDEX No. 39 - 607

120

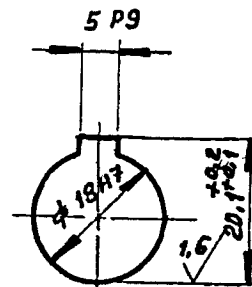
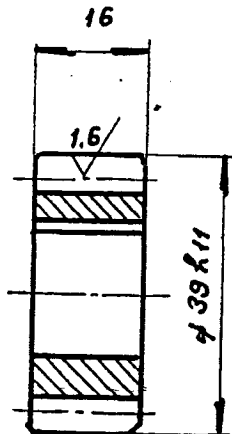
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TIRUCHIRAPALLI-14**



INDEX No. 39 - 607

5 P9	-0,012
	-0,042
φ 18 H7	+0,018
	+0,000
φ 39 h 11	-0,000
	-0,160



NO. OF TEETH : 13
 MODULE : 2,5
 PR. ANGLE : 20°
 QUAL. & TOL. ZONE : 9C DIN 3967
 WIDTH A/C 2 TEETH : 12,038^{-0,127}_{-0,159}
 CORRECTION FACTOR : +0,3
 MATING GEAR NO. OF TEETH : 22
 MATING GEAR DRG. NO. : 4-M-048-22672
 CENTRE DISTANCE : 43,75

01

φ 39 x 16 t.	45 CE IS:7283	D10							
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt (kg)	GROSS Wt (kg)	DRAWING NO.	ITEM NO.

REMARKS				TOTAL NET Wt (kg)				
SCALE 1:1	DRAWN	<i>[Signatures]</i>	REFERENCE	ALTERATIONS		DATE	SIGNATURE	INDEX
	CHECKED			MATL. WAS CAS-IS:2073		190711	<i>[Signature]</i>	01
	APPROVED							
	STDS. OFFICER							
DATE		07.07.86						

	MACHINE	RADIAL DRILLING	TYPE:	RM 65	INV. NO.	
	TITLE:	SPUR GEAR φ 39 137.		DRAWING NO.	4-M-048-22671 14	01
			NO. OF SHEETS	SHEET NO.		

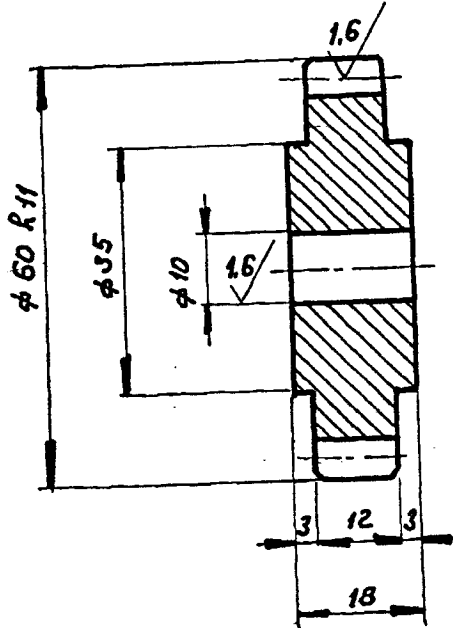
120

3.2 / 1.6

φ 60 R11	- 0, 000
	- 0, 190

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TIRUCHIRAPALLI-14

INDEX No. 39 - 607



NO. OF TEETH : 22
 MODULE : 2.5
 PR. ANGLE : 20°
 QUAL. & TOL. ZONE : 3C DIN 3367
 WIDTH A/C 3 TEETH : 19,221^{-0,161}_{-0,188}
 CORRECTION FACTOR : -
 MATING GEAR NO. OF TEETH: 13
 MATING GEAR DRG. NO. 4-M-4B-22671
 CENTRE DISTANCE : 43,75

01

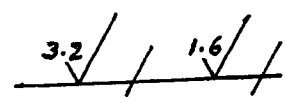
φ 60 x 18 t.		45C8 IS:7283		D.25					
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt(kg)	GROSS Wt(kg)	DRAWING NO.	ITEM NO.
REMARKS			TOTAL NET Wt (kg)						
SCALE	DRAWN	REFERENCE		ALTERATIONS		DATE	SIGNATURE	INDEX	
1:1	CHECKED			MATL. WAS C45- IS:2073		190711	CS	01	
	APPROVED								
	SYDS. OFFICER								
	DATE	07 - 07 - 86							
MACHINE RADIAL DRILLING				TYPE: RM 65		INV. NO.			
TITLE: SPUR GEAR φ 60 22 T.				DRAWING NO. 14		4-M-04B-22672 01			
NO. OF SHEETS				SHEET NO.					



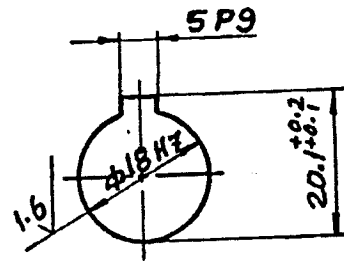
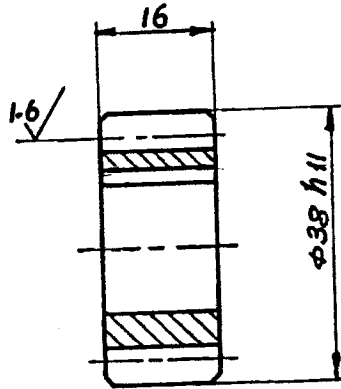
14P

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5 P9	-0.012
	-0.042
Φ18H7	+0.018
	+0.000
Φ38 h11	-0.000
	-0.160



NO. OF TEETH : 12
 MODULE : 2.5
 PRESSURE ANGLE : 20°
 QUAL. & TOL. ZONE : 9C DIN 3967
 WIDTH. A/C 2 TEETH : 12.516^{+0.127}_{-0.169}
 CORRECTION FACTOR : +0.6.
 MATING GEAR NO OF TEETH: 22.
 MATING GEAR DRG. NO. 4-M-04b-22672
 CENTRE DISTANCE : 44.

NOTE:- FOR 13 T REFER DRG.
NO.: 4-M-04b-22761

Φ38x16t.		45C8 IS:7283		0.10					
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt(kg)	GROSS Wt(kg)	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET Wt (kg)					
SCALE	DRAWN	C. EUGINE ROY.		ALTERATIONS		DATE	SIGNATURE	INDEX	
1:1	CHECKED	<i>[Signature]</i>		MATL. WAS C45-Is:2073		190711	<i>[Signature]</i>	①	
	APPROVED	<i>[Signature]</i>							
	STDS. OFFICER	<i>[Signature]</i>							
	DATE	08-10-88.							
MACHINE RADIAL DRILLING.				TYPE: RM 65		INV. NO.			
TITLE:				DRAWING NO.					
SPUR GEAR-12T ^{Φ38}				4-M-04b ¹⁴ -23523				01	
				NO. OF SHEETS		SHEET NO.			

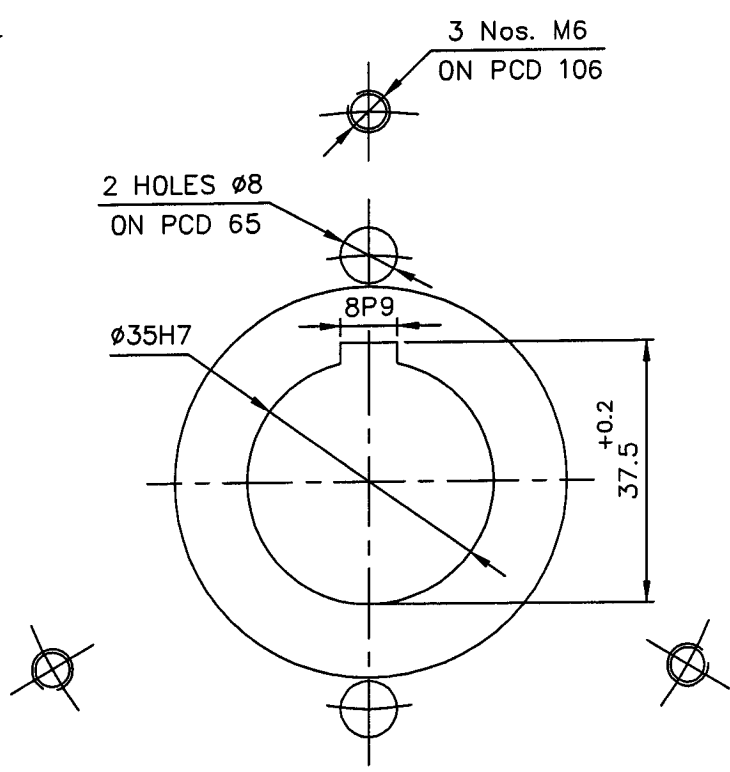
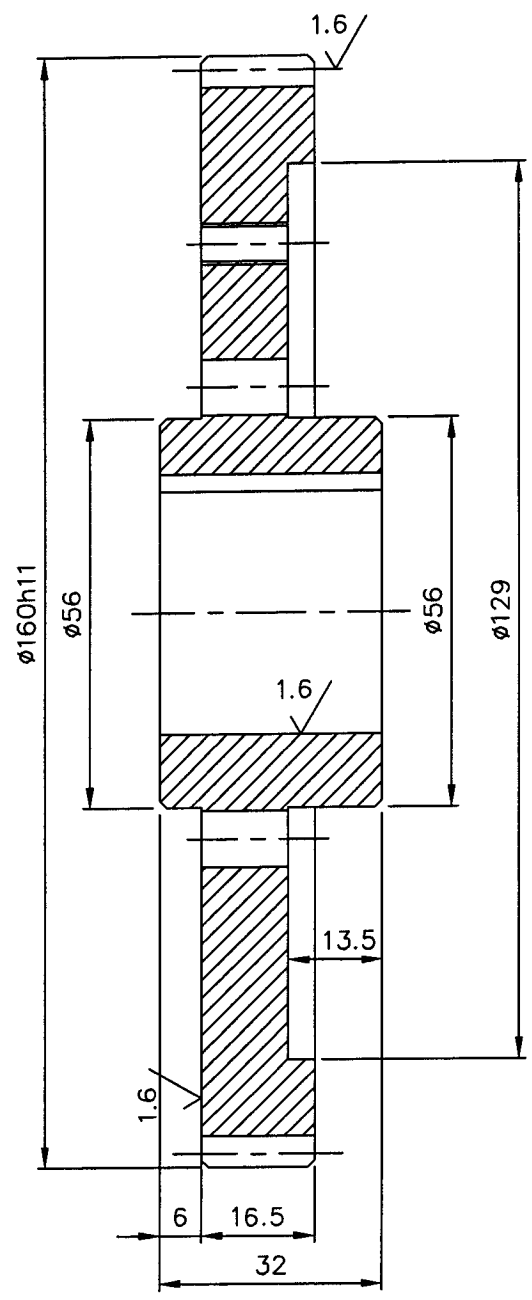


150

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ALL DIMENSIONS ARE IN MM

ø160h11	-0.000	ø35H7	+0.025	3.2//1.6/
	-0.250		+0.000	
		8P9	-0.015	
			-0.051	



No. OF TEETH	78
MODULE	2
PRESSURE ANGLE	20°
WIDTH ACROSS 9 TEETH	-0.158 -0.210 52.37
CORRECTION FACTOR	-
QLTY.&TOL.ZONE	9C DIN 3967
MATING GEAR NO.OF TEETH	27
MATING GEAR DRAWING NO:	4.M.04B14.27761
CENTRE DISTANCE	-

CORNERS TO BE CHAMFERED FOR 1/45°

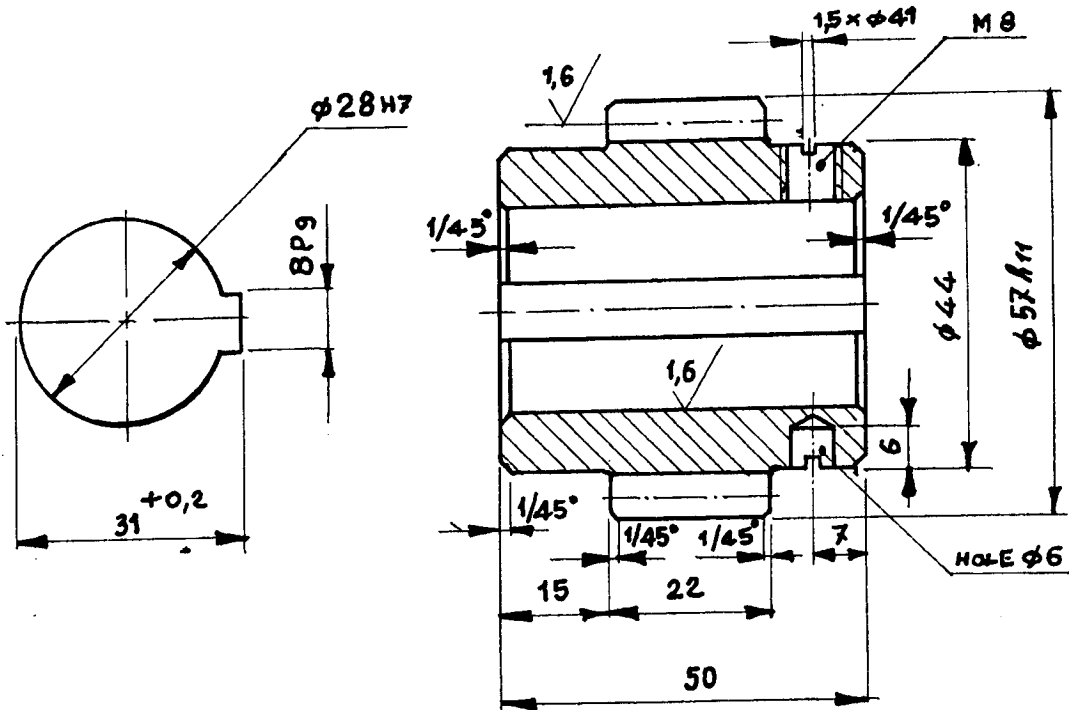
ø160x32L		45C8	IS: 7283	2.5		
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE:		ALTERATIONS:	DCN REF	DATE	SIGN.
SCALE	DRAWN	<i>R. Narayanan</i>				
1:1	CHECKED	R. Ramamoorthy				
	APPROVED	C.S. Jayasheelan				
	DATE	18.11.05				
MACHINE: RADIAL DRILLING			TYPE: RM65			
TITLE: SPUR GEAR ø160/78T (DRILLING HEAD/CLUTCH UNIT)			DRAWING No:			REV.
			4M04B1427762			
			Sheet No:			No. of Sheets:

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 TIRUCHIRAPALLI-14

32 / 1,6

φ28H7	+0,021
	+0,000
BP9	-0,015
	-0,051
φ57h11	-0,000
	-0,190



NO. OF TEETH	17
MODULE	3
PRESSURE ANGLE	20°
CORRECTION FACTOR	-
WIDTH ACROSS 3 TEETH	22,855 ± 0,070
QUALITY TOL. ZONE	9E DIN 3967
MATING GEAR NO OF TEETH	53
MATING GEAR DRG NO	4-M-04b-6153
CENTRE DISTANCE	105

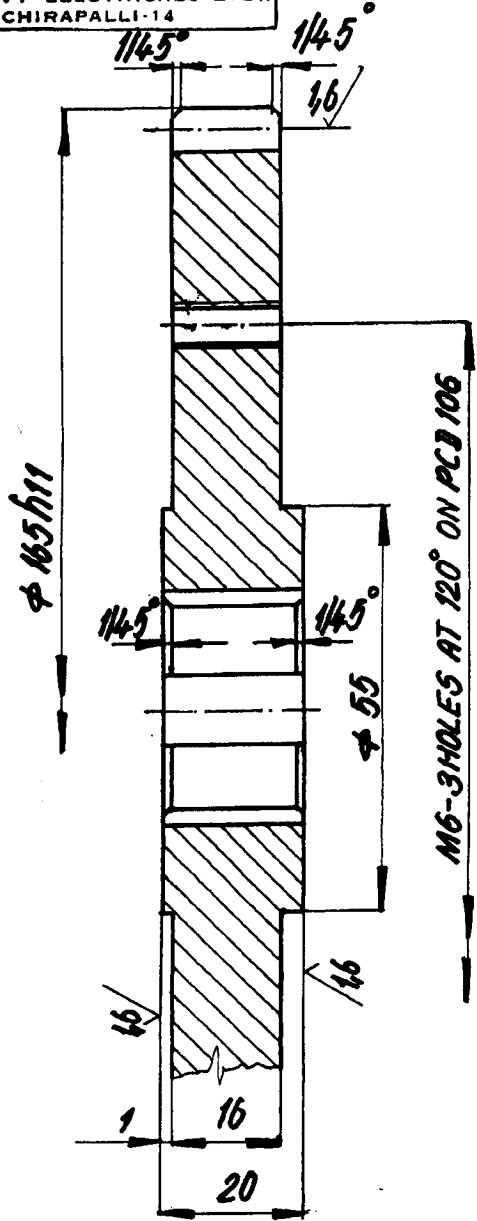
CASE HARDENED TO HRC 58 ± 2
CASE DEPTH 0,6 mm

		15 Cr 3 IS 4432				4-M-04b-0093		41	
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt (kg)	GROSS Wt (kg)	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET Wt (kg)					
SCALE 1:1	DRAWN / TED	<i>K.S. Ravindran</i>		REFERENCE	ALTERATIONS		DATE	SIGNATURE	INDEX
	CHECKED	<i>[Signature]</i>							
	APPROVED	<i>[Signature]</i>							
	STDS. OFFICER	<i>[Signature]</i>							
	DATE	22-11-1992							
MACHINE RADIAL DRILLING				TYPE: RM 52, 62 & 85		INV. NO.			
TITLE:				DRAWING NO.					
MOTOR PINION 17T/φ57				4-M-04b-6151					
NO. OF SHEETS				SHEET NO.					

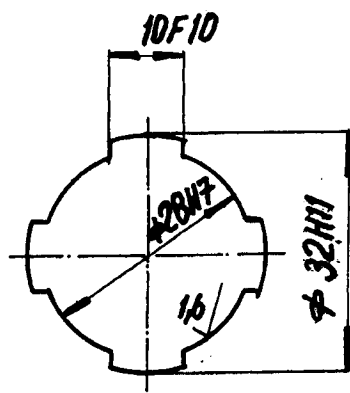


32/ / 16/

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BHARAT HEAVY ELECTRICALS LTD.,
 TIRUCHIRAPALLI-14



φ 165h11	-0,000
	-0,250
φ 28H7	+0,021
	+0,000
10F10	+0,013
	+0,070
φ 32H11	+0,160
	+0,000



NO OF TEETH	53
MODULE	3
PRESSURE ANGLE	20
CORRECTION FACTOR	-
WIDTH ACROSS 7 TEETH	59,793 ^{-0,133}
QUALITY AND TOL. ZONE	8e 31Y 3967
MATING GEAR NO. OF TEETH	17
MATING GEAR DRG. NO	4-M-046-6151
CENTRE DISTANCE	105

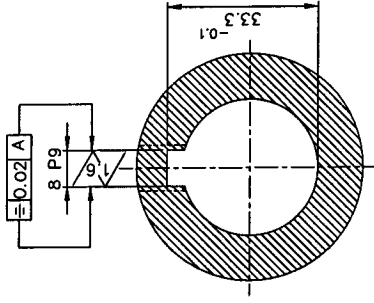
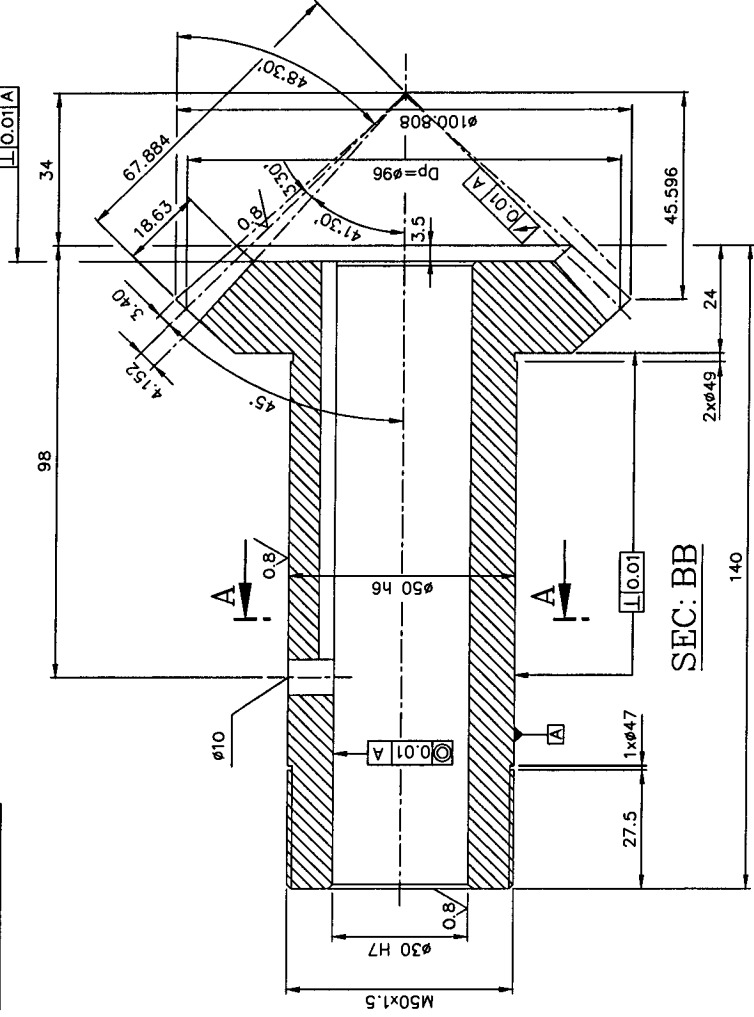
CASE HARDEN TO HRC 56^{±2}
 CASE DEPTH - 0,8mm

		15C13 IS 4432				0-M-046-0093 46			
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt(kg)	GROSS Wt(kg)	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET Wt (kg)					
SCALE 1:1	DRAWN	T.C.D. T.N.K/O. Information		REFERENCE	ALTERATIONS		DATE	SIGNATURE	INDEX
	CHECKED	<i>[Signature]</i>							
	APPROVED	<i>[Signature]</i>							
	STDS. OFFICER	<i>[Signature]</i>							
DATE		28-8-70/16-2-78							
MACHINE		RADIAL DRILLING		TYPE: RM 52, 62		INV. NO.			
TITLE:		SPUR GEAR 53T/φ165		DRAWING NO. 10 & 12		4-M-046-6153			
P.N.O. D278102				NO. OF SHEETS		SHEET NO.			



38

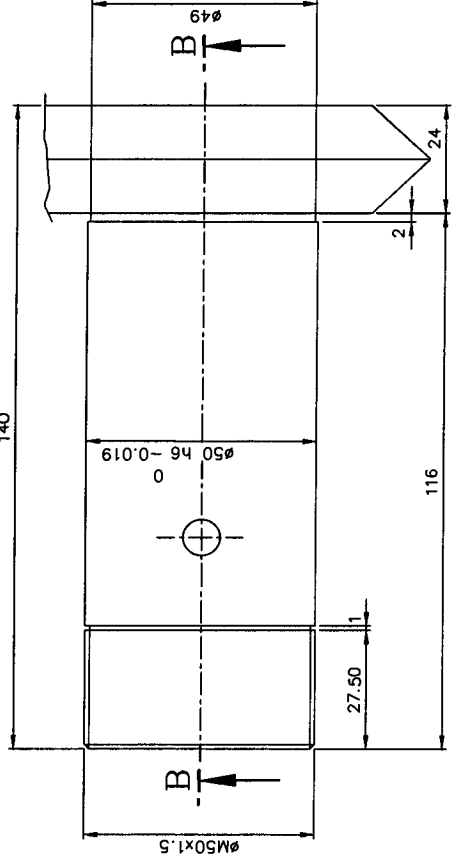
ALL DIMENSIONS ARE IN MM



SECTION: AA

NO. OF TEETH	24
MODULE	4
PRESSURE ANGLE	20°
MATING GEAR NO. OF TEETH	24
SPIRAL ANGLE	35°
MATING DRAWING NO.	3M12B3714131
SHAFT ANGLE	90°

NOTE: -
 --- CASE HARDENED TO HRc. 60
 CASE DPTH 0.8 mm.
 AVOID SHARP CORNERS



SEC: BB

8 P9	-0.015	±0.02 A	-0.000	32/1.6/0.8
	-0.051	±0.01 A	-0.019	
			+0.025	
			+0.000	

RODØ101x140 L	13Ni.13 Cr.3	IS: 4432	2.09		
DESCRIPTION	MATERIAL	STANDARD	NET WT. IN KGS.	DRAWING No.	ITEM No.
REFERENCE	DRG No: SAFDP-0410240017	ALTERATIONS:	ICN REF	DATE	SIGN
DRAWN/TCD	PA. ROSS				
CHECKED	R. RAMAMOORTHY				
APPROVED	C.S. JAYASHEELAN				
DATE	24-04-10				
SCALE	1:1				
MACHINE	PIPE CHAMFERING M/C				
TITLE	SPIRAL BEVEL GEAR		DRAWING No.	REV	
			3M12B3714132		
			24T/Ø101		
			(X' AXIS DRIVE)		
			TYPE: TURBATIC 1200 CNC		
			Sheet No.		
			No of Sheets		

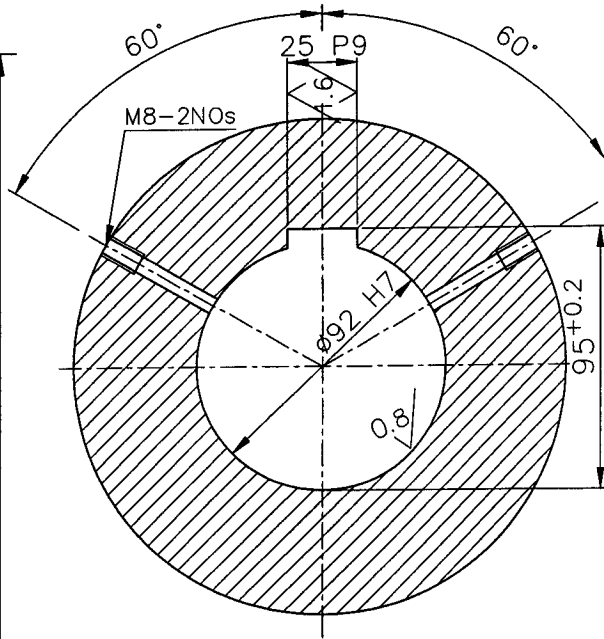
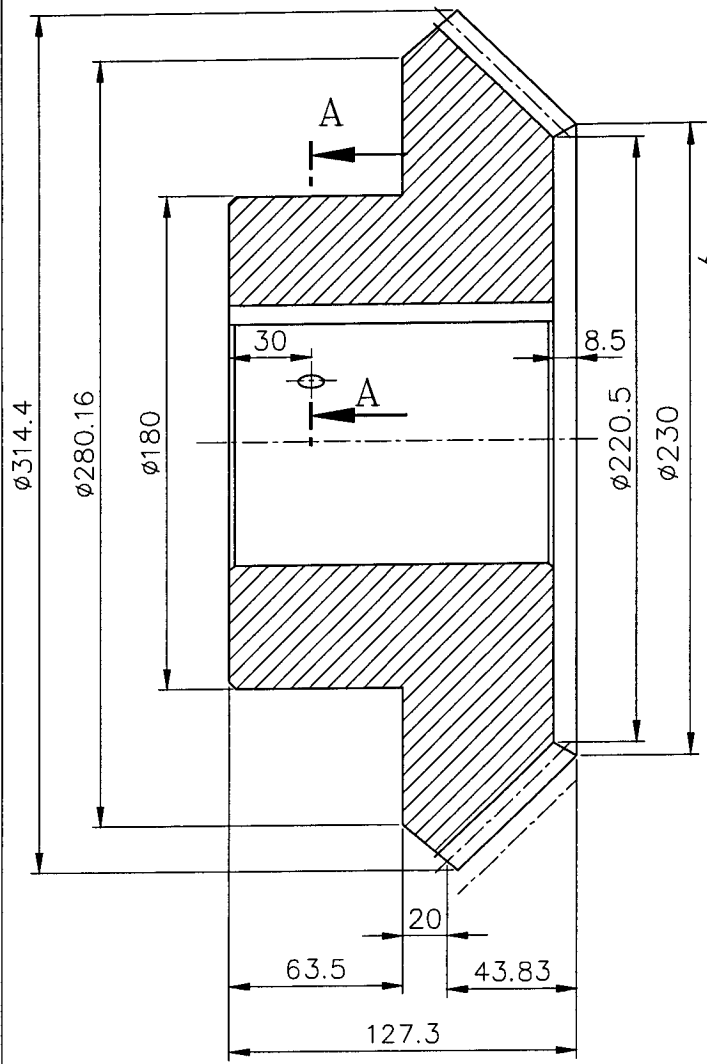
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200

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ALL DIMENSIONS ARE IN MM

ø92 H7	+0.035	3.2/1.6/0.8/
	0.000	
25 P9	-0.022	
	-0.074	



SECTION-AA

NOTE:
 AVOID SHARP CORNERS
 CASE HARDENED TO HRC.35 ± 2
 CASE DEPTH 0.8

NO.OF TEETH	30
MODULE	3
PRESSURE ANGLE	20°
SPIRAL ANGLE	35°
MATING GEAR NO.OF TEETH	30
MATING GEAR DRG. NO.	4M10A6329598
SHAFT ANGLE	90

No. of Pieces	ø315x128 L	55 C8	IS:5517	45.2	DRAWING No.		ITEM No.		
	DESCRIPTION		MATERIAL	STANDARD	NET.WT.IN KGS.	DCN REF	DATE	SIGN.	INDEX
SCALE 2.5:1	DRN.	P.Albert Ross		REFERENCE: 1050-8399-8400-01		ALTERATIONS:			
	CHD.	G.Govindaraj							
	APPD	K.Ramanan							
	DATE	12-12-12							
	MACHINE: PIPE TO PIPE & PIPE FITTING&WELDING			TYPE: FINEARC/APW 1200					
	TITLE: BEVEL GEAR-30T (HEAD STOCK MANIPLATOR ASSY)			DRAWING No: 4M10A6329597			REV.		

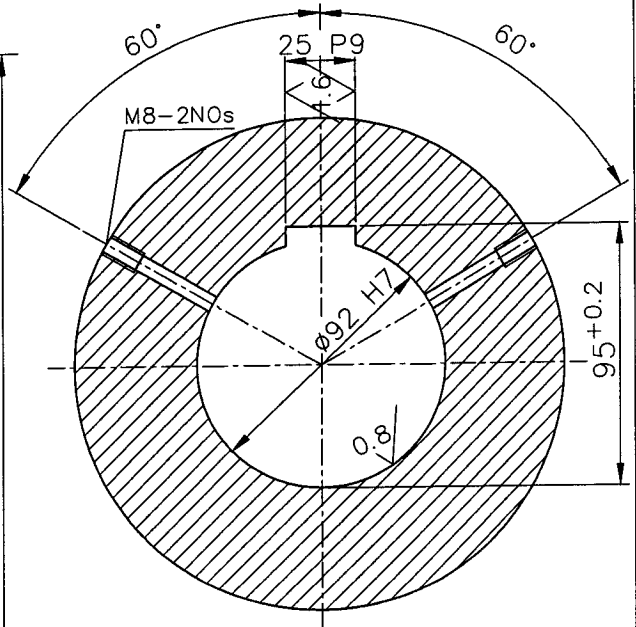
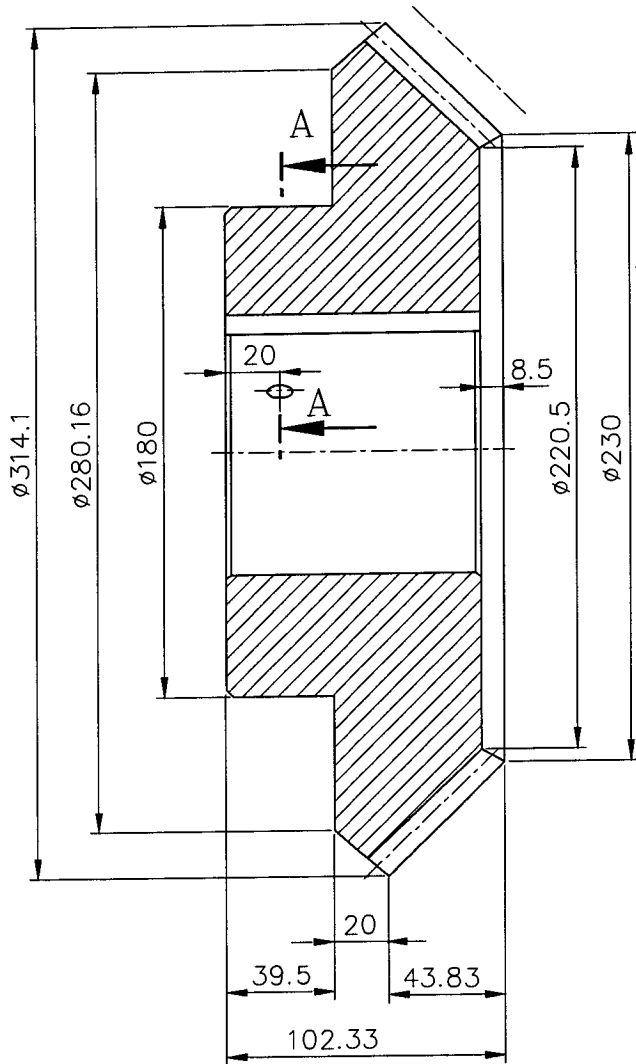
2/10

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ALL DIMENSIONS ARE IN MM

ø92 H7	+0.035
	0.000
25 P9	-0.022
	-0.074

3.2/1.6/0.8/



SECTION-AA

NOTE:
AVOID SHARP CORNERS

NO.OF TEETH	30
MODULE	3
PRESSURE ANGLE	20°
SPIRAL ANGLE	35°
MATING GEAR NO.OF TEETH	30
MATING GEAR DRG. NO.	4M10A6329597
SHAFT ANGLE	90

		ø315x103 L	45 C8	IS: 7283	36.46		
No. of Pieces	DESCRIPTION		MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	
				ALTERATIONS:	DCN REF	DATE	SIGN.
	REFERENCE: 1050-8399-8400-01						INDEX
SCALE	DRN.	P.Albert Ross					
2.5:1	CHD.	G.Govindaraj					
	APPD	K.Ramanan					
	DATE	12-12-12					
MACHINE: PIPE TO PIPE & PIPE FITTING&WELDING				TYPE: FINEARC/APW 1200			
		TITLE: BEVEL GEAR-30T (HEAD STOCK MANIPLATOR ASSY)		DRAWING No:		REV.	
				4M10A6329598			

239

Caution

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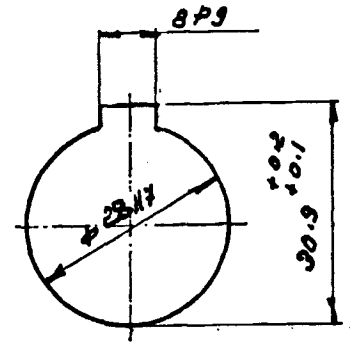
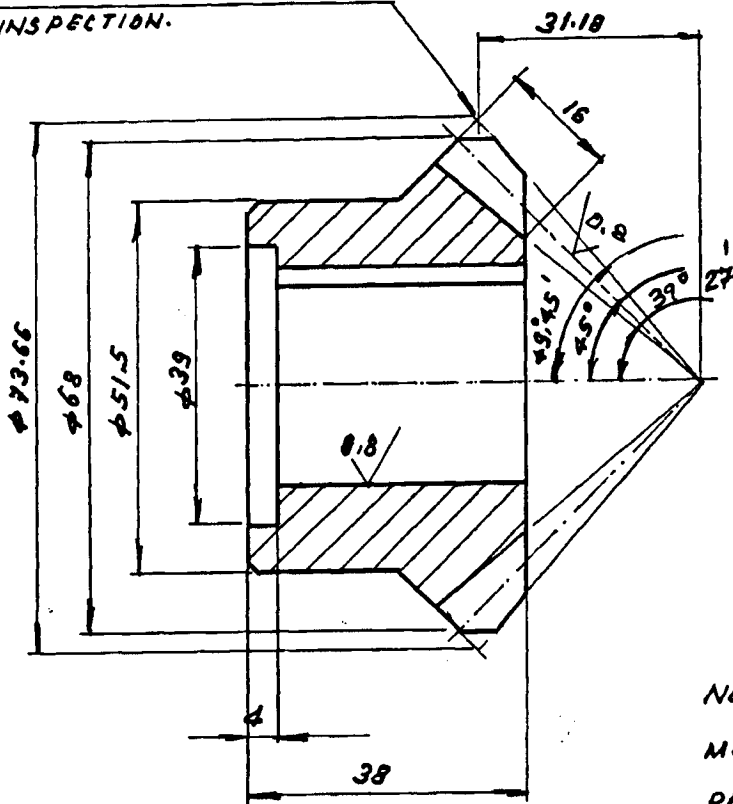
$\phi 28 H7$	$+0.021$
	$+0.000$
$8P9$	$+0.015$
	$+0.051$

1.6 / 0.8 ✓

39-607 A

ALL DIMENSIONS IN MM.

TIP TO BE REMOVED AFTER INSPECTION.



NO. OF TEETH	17
MODULE	4
PR. ANGLE	20°
MATING GEAR NO. OF TEETH	17
MATING GEAR DRG. NO.	4-M-01B-06056
SHAFT ANGLE	90°

CHAMFER ALL SHARP CORNERS TO 1/45°

CASE HARDENED TO HRC 60
CASE DEPTH 0.8

$\phi 74 \times 38 L$	16Ni 3Cr2	IS: 4432	0.76	Q-M-01B-0188	46
				Q-M-01B-0329	

NO. OF	DESCRIPTION	MATERIAL	STD./SPS	Wt.	GRASS	DRAWING No.	Item
REFERENCE:							
			ALTERATIONS	CC: 06	CC: 11	DCN	DATE
SCALE	DRAWN / TRA	VERGESE / PAR					
1:1	CHECKED	R. Ramamathy					
	APPROVED	P. S. Kallada					
	DATE	24-2-70 / 10-10-57					

	MACHINE: HORIZONTAL BORING	TYPE: W100 / H100A	Total wt. (kg.)
	TITLE	DRAWING No.	REV.
	BEVEL GEAR	4-M-01B-06057	
	$\phi 73.66 / 17T$	No. of Sheets:	Sheet No.

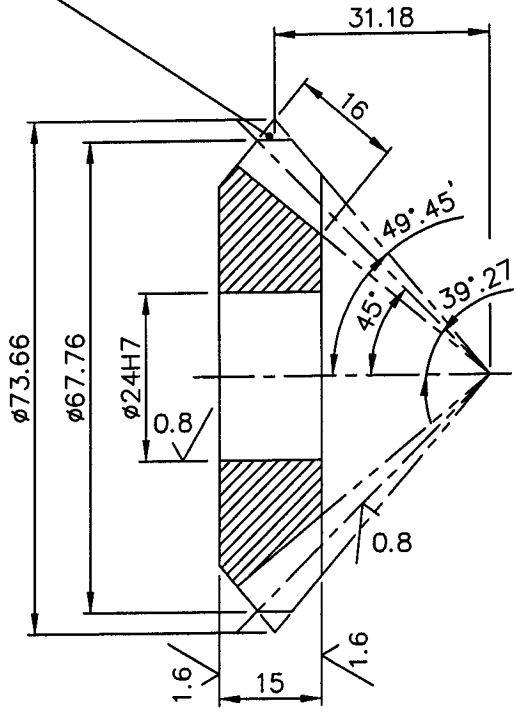
240

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ALL DIMENSIONS ARE IN MM

ø24H7	+0.021	3.2/1.6/0.8/
	+0.000	

TIP TO BE REOVED AFTER INSPECTION



NOTE: -
 CASE HARDENED TO HRC 60⁺²
 CASE DEPTH 0.8

No. OF TEETH	17
MODULE	4
PRESSURE ANGLE	20°
MATING GEAR NO.OF TEETH	17
MATING GEAR DRAWING NO:	4.M.01B06.06055 4.M.01B06.06057
SHAFT ANGLE	90°

ø73.66x15L	16 Ni 3Cr 2	IS: 4432	0.36	O.M.01B06.00188	45
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X						
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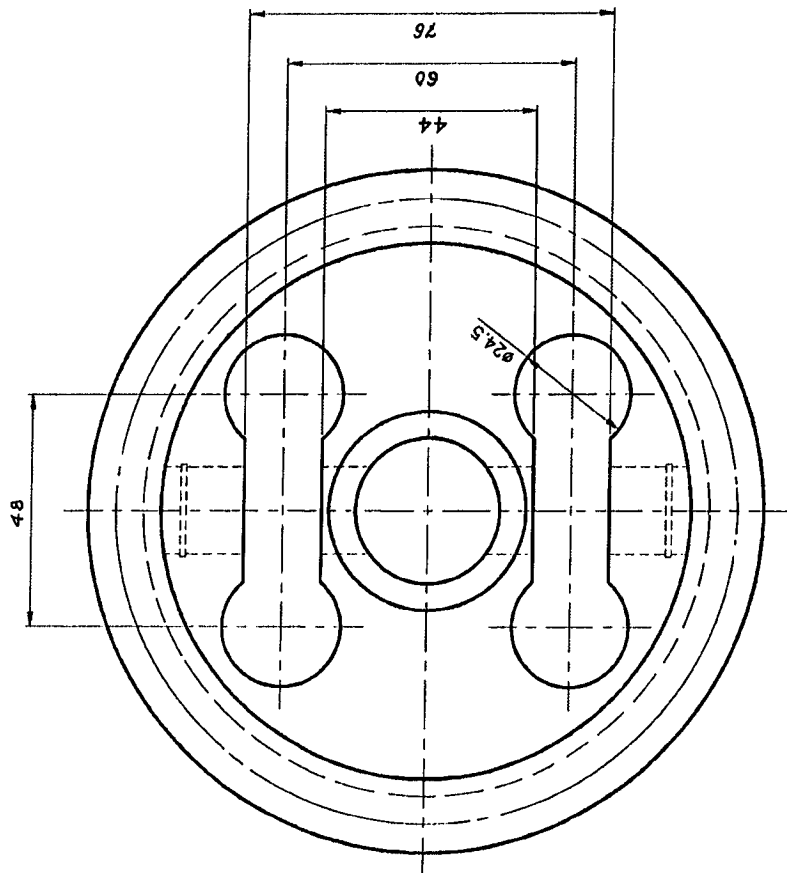
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE:		ALTERATIONS:	DCN REF	DATE	SIGN.

SCALE	DRAWN/TCD	<i>R. Narayanan</i>	DRG. MODIFIED TO DATE	07.01.13	K.RAMANAN	01
1:1	CHECKED	R.RAMAMOORTHY				
	APPROVED	C.S.JAYASHEELAN				
	DATE	27.07.70/18.01.07				

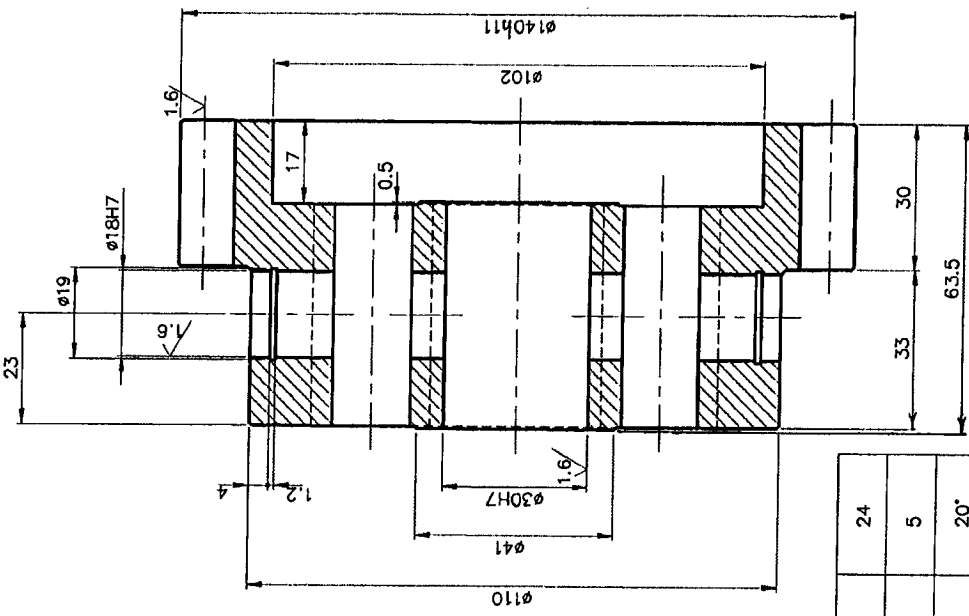
	MACHINE: HORIZONTAL BORING	TYPE: W100/H100A
	TITLE:	DRAWING No: 04
	BEVEL GEAR ø73.66x17T	4M01B0606056 01
	Sheet No:	No. of Sheets:

30

±0.018	±0.018
+0.000	+0.000
+0.021	+0.021
+0.000	+0.000
-0.000	-0.000
-0.250	-0.250



SHARP EDGES TO BE CHAMFERED TO 0.5/45°



NO. OF TEETH	24
MODULE	5
PRESSURE ANGLE	20°
CORRECTION FACTOR	+1.08
WIDTH ACROSS 3T	-0.178 42.27 - 0.237
QUALITY & TOL ZONE	9-DIN3967
MATING GEAR NO. OF T.	48
MATING GEAR DRG. NO.	4-M-016-253/0
CENTRE DISTANCE	185

ALL DIMENSIONS ARE IN MM

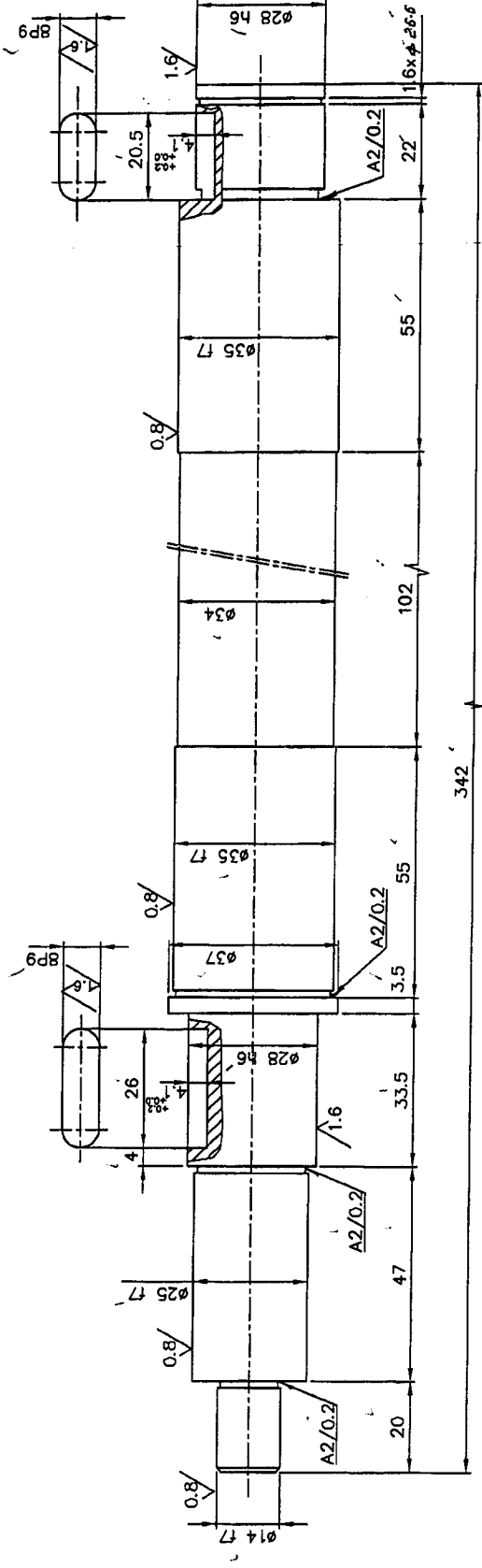
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QTY	140 x 63.5	45°	BM-C45	25:7203	0-M-016-0188	42
DESCRIPTION	SPUR GEAR	MATERIAL	NET.WT. IN KGS.	DRAWING No.	0-M-016-0188	ITEM No.
REFERENCE		COMPONENT CODE: 08	EQUIPMENT CODE: 06	DRG. No.	0-M-016-0188	REV.
SCALE	1:1	ALTERNATIONS:	DCN REF	DATE	06	REV.
CHECKED						
APPROVED						
DATE	11-10-94					
MACHINE: HORIZONTAL BORING		TYPE: W 100		DRAWING No.		06
TITLE: SPUR GEAR		221228-2266 D1		3-M-016-02536		REV.
		0140/24T		Sheet No.		

260

3.2/1.6/0.8

φ35 f7	-0.025	φ14 f7	-0.016
	-0.050		-0.034
φ28 h6	-0.000	φ25 f7	-0.020
8 P9	-0.013		-0.041
	-0.015		
	-0.051		



CHAMFER SHARP CORNERS TO 1/45°

ROD φ37x342 L	45 C8	IS: 7283	1.90	0-M-01B-00329	122
DESCRIPTION	MATERIAL	STANDARD	NET WT. IN KGS.	DRAWING No.	ITER No.
221228-2254 E1	⊗	COMPONENT CODE: O1	EQUIPMENT CODE: O6		
SCALE DRAWN	TCD/P.A.R./	ALTERATIONS	DCN REF	DATE	SIGN.
CHECKED					
APPROVED					
DATE	27-07-70/04-08-03				
MACHINE/HORIZONTAL BORING			TYPE: W 100		
TITLE:			DRAWING No.		
SHAFT OD 37x342 L			3-M-01B-02540		
REV.			Sheet No.		

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ALL DIMENSIONS ARE IN MM

089

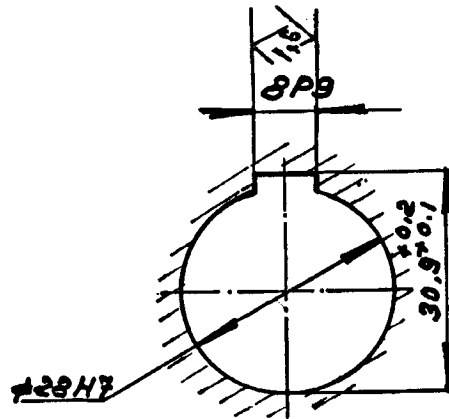
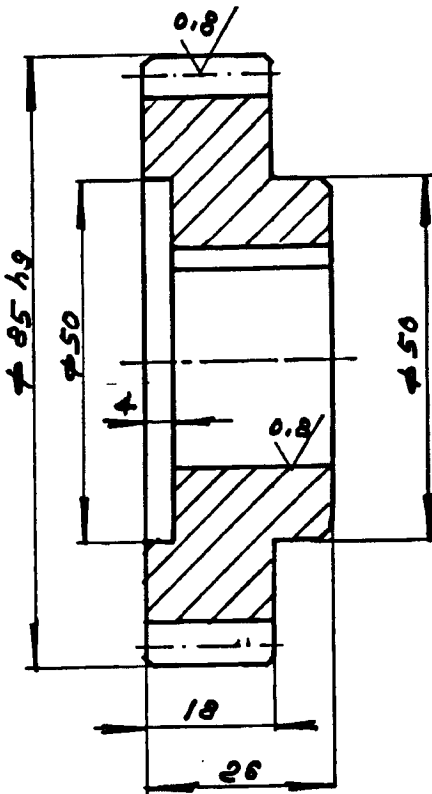
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φ85h9	-0.087	φ23H7	+0.021
	-0.000		+0.000
		BPS	-0.015
			-0.051

2.2	1.6	0.2
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39-607 A



NO. OF TEETH	18
MODULE	4
PR. ANGLE	20°
CORRECTION FACTOR	+0.79
WIDTH ACROSS 3T	32.69 ^{+0.051} _{-0.085}
QUAL. & TOL. ZONE	8c JIN396%
MATING GEAR DAG No.	-
MATING GEAR NO. OF TEETH	72
CENTRE DISTANCE	185

TOPPING EFFECTED

SHARP CORNERS TO BE CHAMFERED TO 1/45°

CASE HARDENED TO HRC 60^{±2}

CASE DEPTH 0.8

φ85 x 26		13 Ni3 Cr 80	IS: 4432	0.75	0-M-016-0108	41		
No. of pgs.	DESCRIPTION	MATERIAL	STD/BPS	Wt. in Kg.	Gross	DRAWING No.	Item No.	
REFERENCE:		ALTERATIONS / EC: 06 / CC: 02		DATE	SIGN.	Inde-		
SCALE 1:1	DRAWN	[Signature]						
	CHECKED	[Signature]						
	APPROVED	[Signature]						
	DATE	1-04-94						
MACHINE: HORIZONTAL BORING	TYPE: W100		Total wt. (kg.)					
	TITLE PART No. 560/2454-41	DRAWING No.		REV.				
SPUR GEAR φ85/18T		4-M-016-06-6054						
No. of Sheets:		Sheet No.						