



BHARAT HEAVY ELECTRICALS LIMITED

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


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

429-002/A

Enquiry No	Enquiry Date	Due Date for Quotation
2661400559 - 55	19.08.2014	13.09.2014
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	7501B1902600 SHOULDER SCREW AS PER DRG.NO. 4M-01B-19-26254 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 YEAR EXPERIENCE IN THIS FIELD. 2.PREVIOUS PO DETAILS FOR SUPPLYING SIMILAR KIND OF ITEMS 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	24.000	24.00	05.11.14
20	7501B1903600 PINION SHAFT AS PER DRG NO. 4M-01B-19-25317. NOTE: FOR SL.NO. 20 AND 30 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	3.000	3.00	05.11.14
30	7501B1903700 SPUR GEAR AS PER DRG. NO. 4M-01B-19-25318.	NO	3.000	3.00	05.11.14
40	7501B1901300 BOX NUT AS PER DRG NO. 4M-01B-19-27363-01 NOTE: FOR SL.NO. 40 AND 50 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	6.000	6.00	05.11.14
50	7501B1901200	NO	2.000	2.00	05.11.14

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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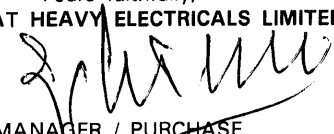
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Web:

2661400559 / 19.08.2014

Sl. No.	Description	Unit	Quantity	Rate	Amount	Delivery Date
	SCREW ROD AS PER DRG. NO. 4M-01B-19-27362-01					
60	7501B1904300 SLEEVE AS PER DRG NO: 4M-01B-19-25322	NO	4.000	4.00		05.11.14
70	7501B1902700 CLUSTER GEAR AS PER DRG.NO. 3-M-01B-19-11787 NOTE: FOR SL.NO. 70 AND 80 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	3.000	3.00		05.11.14
80	7501B1903200 BEVEL PINION AS PER DRG.NO. 4M-01B-19-26559	NO	3.000	3.00		05.11.14
90	7501B1904400 PINION AS PER DRG NO: 4M-01B-19-26410 NOTE: FOR SL.NO. 90,100 AND 110 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	2.000	2.00		05.11.14
100	7501B1904500 PINION AS PER DRG NO: 4M-01B-19-26411	NO	2.000	2.00		05.11.14
110	7501B1904600 SPUR GEAR AS PER DRG NO: 4M-01B-19-26415	NO	2.000	2.00		05.11.14
120	7501B1904700 SHAFT AS PER DRG NO: 4M-01B-19-26414	NO	5.000	5.00		05.11.14
130	7501B1904800 RING AS PER DRG NO: 4M-01B-19-26449	NO	3.000	3.00		05.11.14
140	7501B1904900 LOCK NUT AS PER DRG NO: 4M-01B-19-26455	NO	5.000	5.00		05.11.14
150	7501B1905000 SHAFT AS PER DRG NO: 4M-01B-19-26413	NO	5.000	5.00		05.11.14
160	7501B1905100 SHAFT AS PER DRG NO: 4M-01B-19-25321	NO	5.000	5.00		05.11.14
170	7501B1903500 PINION SHAFT AS PER DRG.NO.4M-01B-19-28534.	NO	5.000	5.00		05.11.14

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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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2661400559 / 19.08.2014

180	7501B1904100 SPIRAL BEVEL GEAR AS PER DRG NO: 4M-01B19-29159-01 NOTE: FOR SL.NO. 180 AND 190 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	3.000	3.00	05.11.14
190	7501B1904000 SPIRAL BEVEL GEAR AS PER DRG NO: 4M-01B-19-29160	NO	3.000	3.00	05.11.14
200	7501B1900700 DOUBLE GEAR AS PER DRG. NO. 4-M-01B-19-26394-01. NOTE: FOR SL.NO. 200,210 AND 220 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	3.000	3.00	05.11.14
210	7501B1900800 PINION SHAFT AS PER DRG.NO. 4-M-01B-19-26252.	NO	3.000	3.00	05.11.14
220	7501B1902800 SPUR GEAR AS PER DRG.NO. 3-M-01B-19-11790	NO	3.000	3.00	05.11.14

General Note:

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

ENCLSOURES:ANNEXURE II,III,IV,V,VI,VII & DRAWINGS.


Enclosures:

"LD clause has to be confirmed without fail."

"Payment to vendors will be made only thro E-Payment mode"

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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:-

- a) 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.
- b) 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
- c) 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.
- d) 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</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 MIS
(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 per the latest audited financial year as per MSMED Act 2006 is as follows:

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.0,1722(E) dated October 6. 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

(Strike off whichever is not applicable)

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

Or

The company has been graduated from its original category (Micro/ Small) (Strike off which is not
applicable) and the date of graduation of such enterprise from its original category is
(dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such
enterprise from its original category as notified vide S.D. No. 3322(E) dated 01.11.2013
published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name -

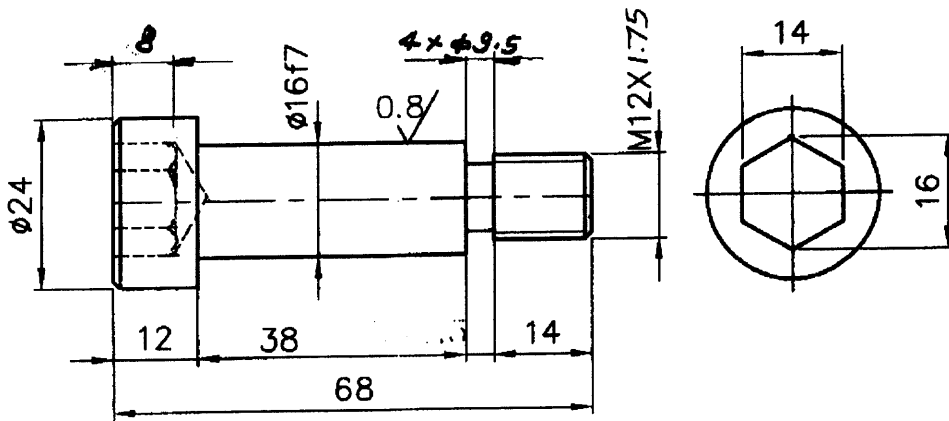
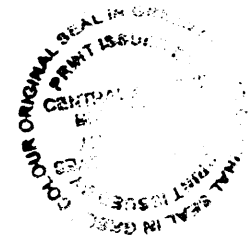
Membership number -

Seal of Chartered Accountant

CAUTION: THIS DRAWING IS OUR SOLE PROPERTY AND SHOULD NOT BE USED IN ANY WAY FOR ANY PURPOSE WITHOUT THE WRITTEN PERMISSION OF BHARAT HEAVY ELECTRICALS LIMITED TRICHURAPPALLI - 680 014.

ALL DIMENSIONS ARE IN MM

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			-0.034	



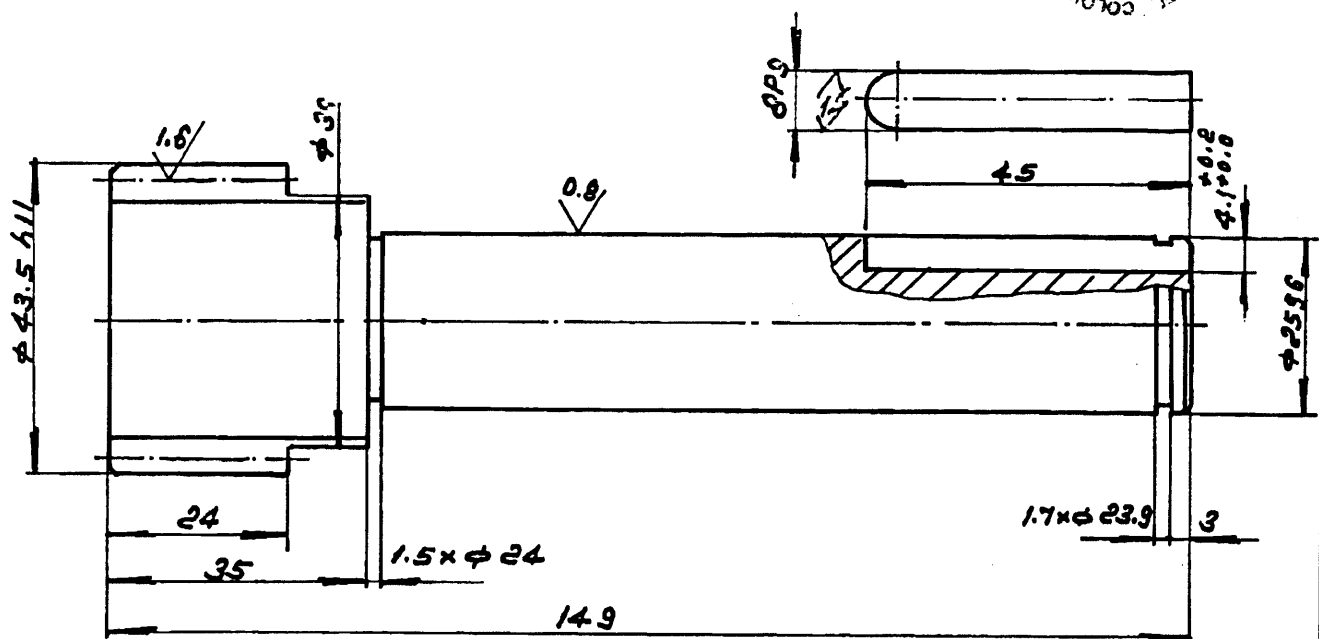
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REFERENCE:				COMPONENT CODE: 33	EQUIPMENT CODE: 19		
SCALE			ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX
1:1	DRAWN	<i>RP</i>					
	CHECKED	<i>R. Ramamathy</i>					
	APPROVED	<i>[Signature]</i>					
	DATE	11.8.98					
MACHINE: HORIZONTAL BORING			TYPE: HB 617 UTA160		REV.		
TITLE: <i>LD ANDREA FACING HEAD Assy</i> SHOULDER SCREW-M12.68L			DRAWING No: <i>19</i> 4-M-01B-26254		No. of Sheets: <i>19</i> Sheet No		

Caution
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φ43.5/11	-0.000	φ2596	+0.007
	-0.160		+0.020
		8P9	-0.015
			-0.051

3.2 / 1.6 / 0.8

39-607 A



NO. OF TEETH	19
MODULE	2
PR. ANGLE	20°
CORRECTION FACTOR	+0.38
QUAL. & TOL. ZONE	9c DIN 3967
WIDTH A/C 3 TEETH	15.81 ^{+0.107} _{-0.189}
MATING GEAR NO. OF TEETH	60
MATING GEAR DRG. NO.	4-M-01B-25318
CENTRE DISTANCE	79

CHAMFER SHARP CORNERS TO 1/45°

		CL IV	IS: 1875	0.850	D-M-01B-0082	04	
No. of pcs.	DESCRIPTION	MATERIAL	STD/BPS	Net wt. (kg)	Gross wt. (kg)	DRAWING No.	Item No.
REFERENCE:	PART No. HB 6174205		ALTERATIONS	CC:04	EC:19	DATE	SIGN.
SCALE	DRAWN	<i>[Signature]</i>					
1:1	CHECKED	<i>R. Ramamurthy</i>					
	APPROVED	<i>[Signature]</i> 190794					
	DATE	19-07-94					
	MACHINE: HORIZONTAL BORING CNC		TYPE: HB 617-UT180P		Total wt. (kg.)		
	TITLE PINION SHAFT (φ 43.5/19T)		DRAWING No. 4-M-01B-25318 19		REV.		
No. of Sheets :				Sheet No.			

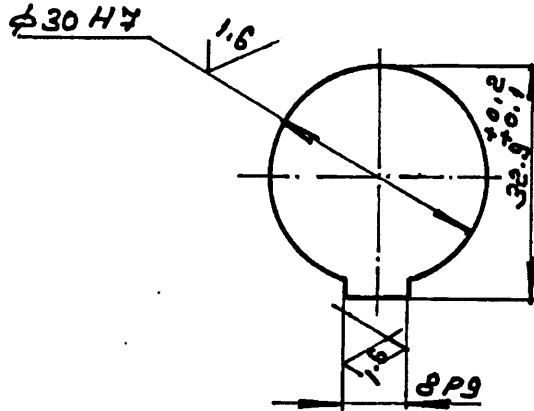
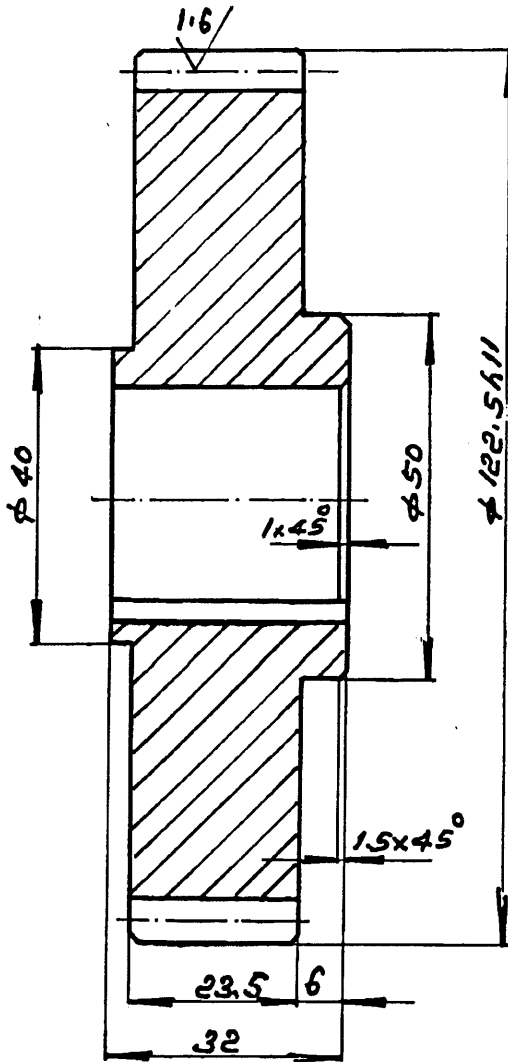
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φ 122.5H11	- 0.000	8P9	+ 0.015
	- 0.250		+ 0.051
φ 30H7	+ 0.021		
	+ 0.000		

3.2 / 1.6 / ✓ / ✓ / ✓ / ✓

39-607 A



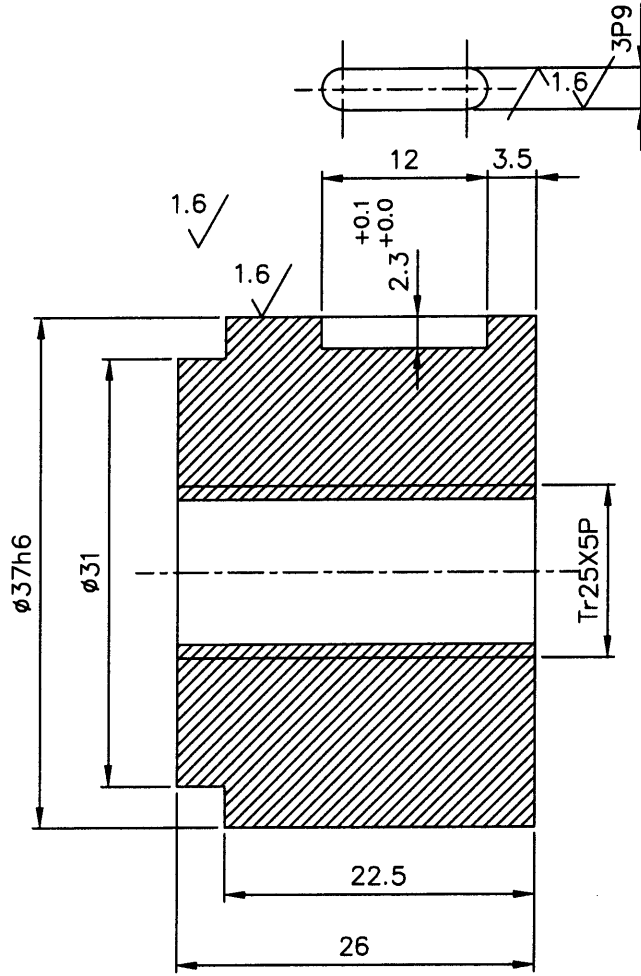
NO. OF TEETH	60
MODULE	2
PR. ANGLE	20°
CORRECTION FACTOR	- 0.38
QUAL. & TOL. ZONE	9C DIN. 3967
WIDTH A/C 7 TEETH	39.53 ^{+0.150} _{-0.210}
MATING GEAR NO. OF TEETH	19
MATING GEAR DRG. No.	4-M-016-25317
CENTRE DISTANCE	79

		CL. IV	IS: 1875		2.2	0-M-016-0082	14
No. of pgs.	DESCRIPTION	MATERIAL	STD/BPS	Net wt. (kg)	Gross wt. (kg)	DRAWING No.	Item No.
REFERENCE:	PART No. HB 6174203	ALTERATIONS	EC: 19	CC: 8	DCN	DATE	SIGN.
SCALE	DRAWN	C. K. S.					
1:1	CHECKED						
	APPROVED						
	DATE	19-07-94					
MACHINE: HORIZONTAL BORING CNC	TITLE	TYPE: HB 617-UTA 180P		Total wt. (kg.)			
	SPUR GEAR (φ 122.5/60T)	DRAWING No.		4-M-016-25318¹⁹			
		No. of Sheets:	Sheet No.				

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ALL DIMENSIONS ARE IN MM

ø37h6	-0.000	3P9	-0.009	3.2 // 1.6 // ✓
	-0.016		-0.034	



NOTE: -

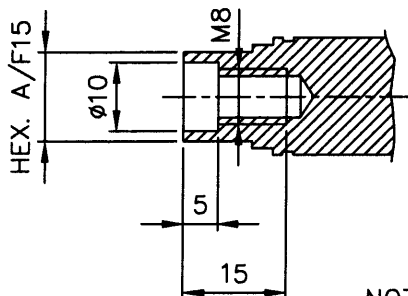
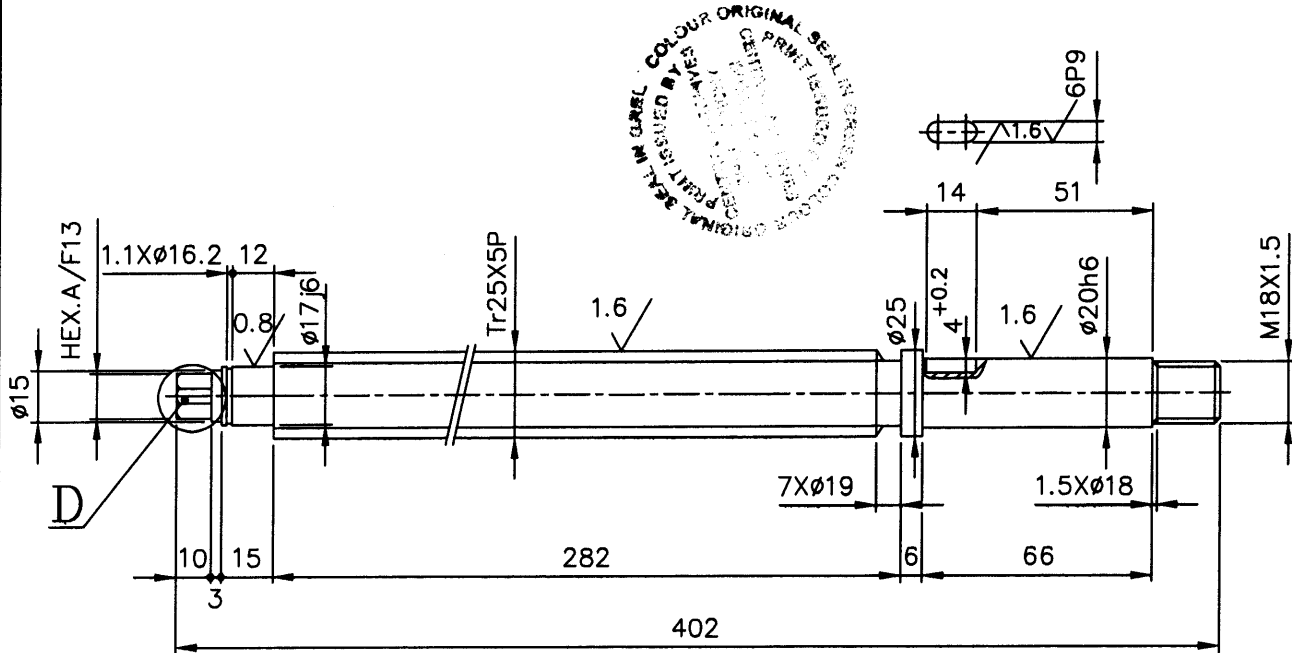
MATING SCREW REF. DRG. No. :- 4-M-01B-27362

	ø37X26L	Pcu Sn7	IS: 28	0.15		
X						
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE:		ALTERATIONS:	DCN REF	DATE	SIGN. INDEX
SCALE	DRAWN	<i>R. Narayanan</i>	DRG. MODIFIED TO DATE		19.03.13	K.RAMANAN 01
2:1	CHECKED	R.RAMAMOORTHY				
	APPROVED	C.S.JAYASHEELAN				
	DATE	24.06.04				
	MACHINE: HORIZONTAL BORING CNC		TYPE: HB617-UTA 160P			
	TITLE:	BOX NUT Tr25X5PX26L	(D'ANDRA ASSY.)	DRAWING No:		REV.
				4M01B192736301		
				Sheet No:		No. of Sheets:

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ALL DIMENSIONS ARE IN MM

6P9	-0.012	ø17j6	+0.008	3.2 / 1.6 / 0.8
	-0.042		-0.003	
		ø20h6	-0.000	
			-0.013	



NOTE: -

HARDENED TO HRc 40^{±0.2}

MATING NUT REF.DRG.No. :- 4-M-01B-27363

DETAIL-D

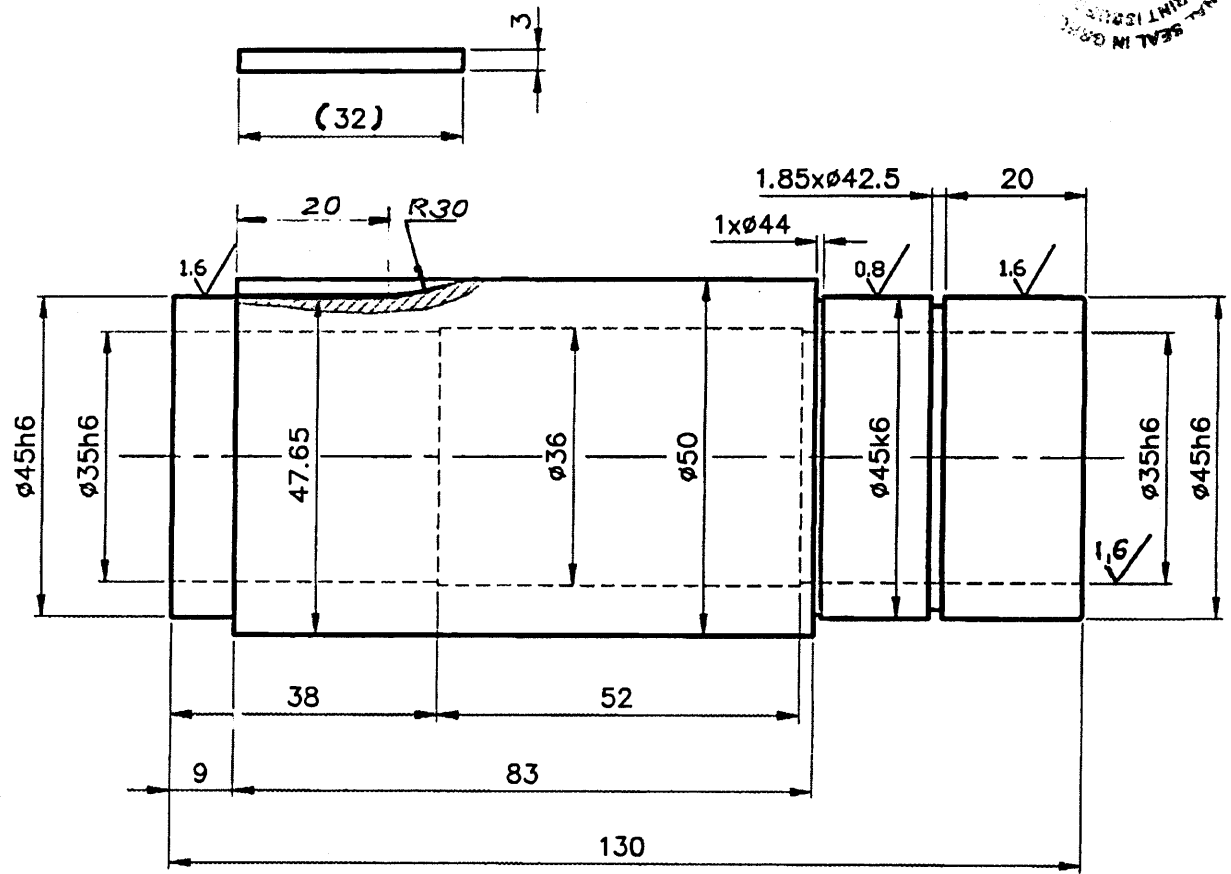
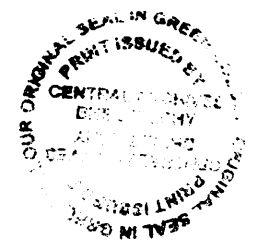
	ø25X402L	55C8	IS: 5517	0.98		
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE:		ALTERATIONS:	DCN REF	DATE	SIGN. INDEX
SCALE	DRAWN	<i>R. Narayanan</i>	DRG. MODIFIED TO DATE		19.03.13	K.RAMANAN 01
1:2	CHECKED	R.RAMAMOORTHY				
1:1	APPROVED	C.S.JAYASHEELAN				
	DATE	24.06.04				
	MACHINE: HORIZONTAL BORING CNC		TYPE: HB617-UTA 160P			
	TITLE: SCREW ROD Tr25X5PX402L (D'ANDRA ASSY.)		DRAWING No:			REV.
			4M01B192736201			
			Sheet No:		No. of Sheets:	

ALL DIMENSIONS ARE IN MM

ø45k6	+0.018	ø35h6 ø45h6	-0.000
	+0.002		-0.016

3.2 / 1.6 / 0.8

CAUTION: THIS DRAWING IS OUR SOLE PROPERTY AND SHOULD NOT BE USED IN ANY FORM FOR ANY PURPOSE WITHOUT THE WRITTEN PERMISSION OF BIHARAT HEAVY ELECTRICALS LIMITED TRICHURAFALLI - 630 014.



AVOID SHARP CORNERS

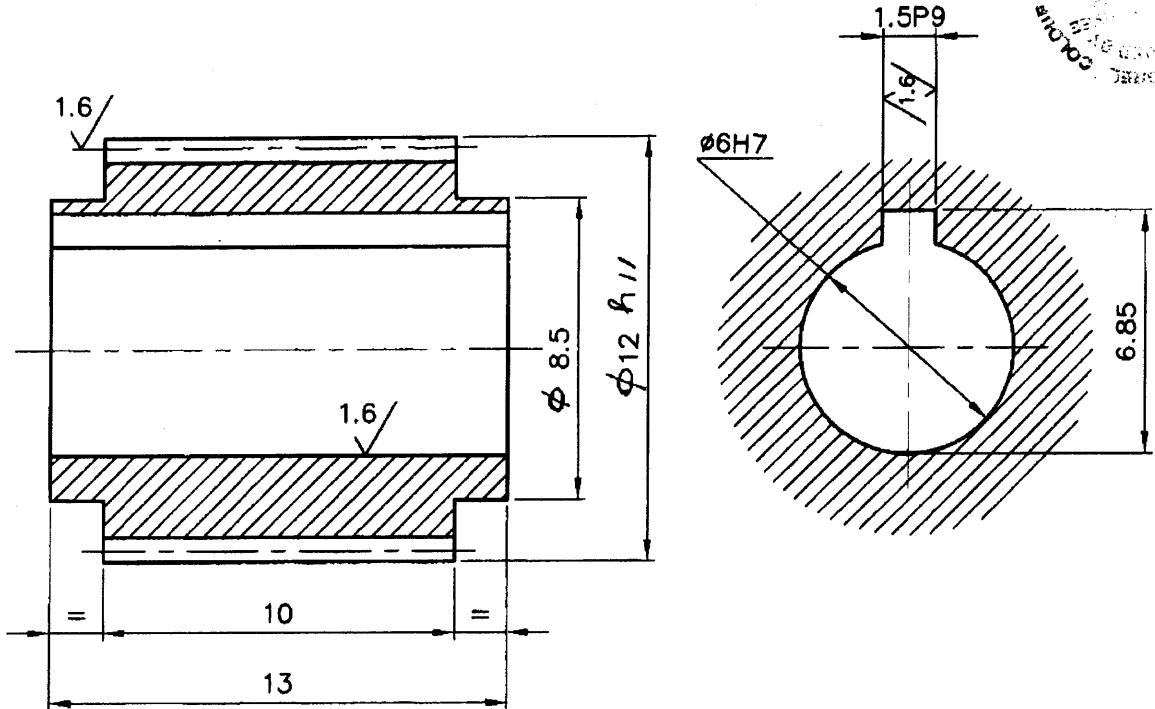
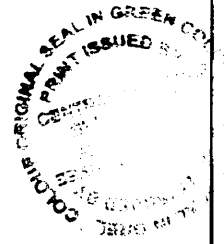
CL IV		IS: 1875	0.95	D.M. 016.0082		71
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
REFERENCE:				COMPONENT CODE: 30	EQUIPMENT CODE: 19	
SCALE	DRAWN	ALTERATIONS:		DCN REF	DATE	SIGN
1:1	CHECKED					
	APPROVED					
	DATE	21/07/94				
MACHINE: HORIZONTAL BORING CNC			TYPE: HB 617 UTA 160P			
TITLE: SLEEVE (ID35xOD50x130L)			DRAWING No: 4-M-016-25322		REV.	
			No. of Sheets:		Sheet No:	

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ALL DIMENSIONS ARE IN MM

ø6H7	+0.012	1.5P9	-0.009
	+0.000		-0.034
ø12h11	-0.000		
	-0.110		

3.2 // 1.6 // 0.8



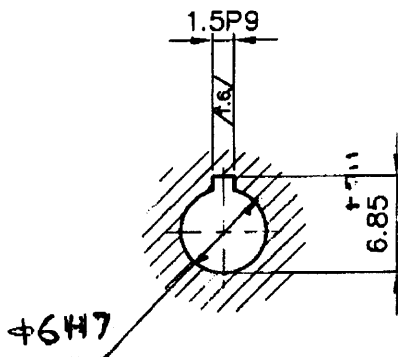
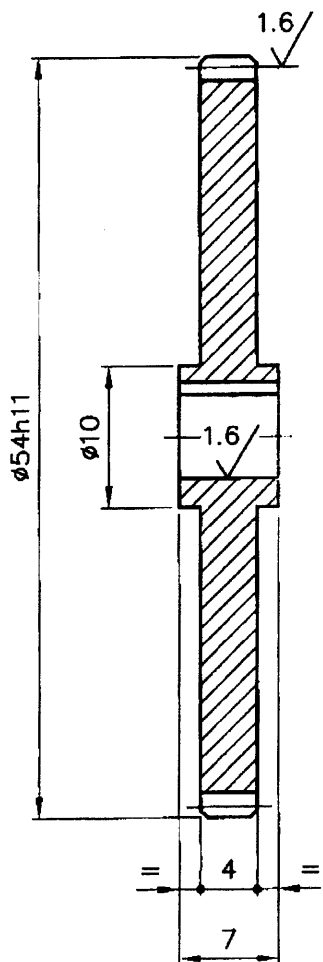
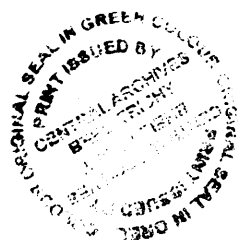
NO. OF TEETH	14
MODULE	0.75
PRESSURE ANGLE	20°
WIDTH ACROSS 2 TEETH	3.468 -0.090 -0.120
CORRECTION FACTOR	-
QLTY. & TOL. ZONE	9C DIN 3967
MATING GEAR NO. OF TEETH	56 & 70
MATING GEAR DRAWING NO.	4-M-01B-26415 4-M-01B-26411
CENTRE DISTANCE	26.25 & 31.5

	ø12X13L	45C8	IS: 7283	ø.01	1-M-01B-02481	35
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT. IN KGS.	DRAWING No.	ITEM No.
REFERENCE:			COMPONENT CODE: 08	EQUIPMENT CODE: 19		
SCALE	DRAWN		ALTERATIONS:	DCN REF	DATE	SIGN. INDEX
5:1	CHECKED					
	APPROVED					
	DATE	22.04.99				
	MACHINE: HORIZONTAL BORING	TYPE: HB617-UTA160P				
	TITLE: PINION ø12X14T (D'ANDREA FACING HEAD ASSY.)	DRAWING No: 19		REV.		
		4-M-01B-26410				
		No. of Sheets:	Sheet No:			

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.

ALL DIMENSIONS ARE IN MM

ø6H7	+0.012	1.5P9	-0.009	3.2//1.6//
	+0.000		-0.034	
ø54h11	-0.000			
	-0.190			



NO. OF TEETH	70
MODULE	0.75
PRESSURE ANGLE	20°
WIDTH ACROSS 9 TEETH	19.555 -0.127 -0.169
CORRECTION FACTOR	-
QTY. & TOL. ZONE	9c DIN 3967
MATING GEAR NO. OF TEETH	14
MATING GEAR DRAWING NO.	4-M-01B-26410
CENTRE DISTANCE	31.5

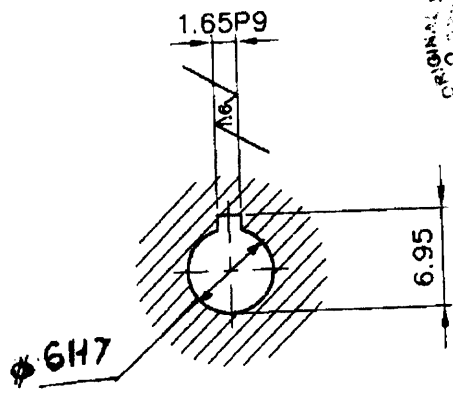
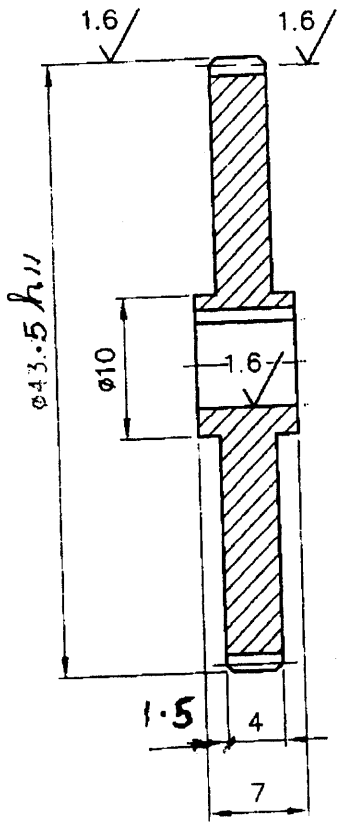
	ø54X14L	45C8	IS: 7283	0.09	1-M-01B-02481	33
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT. IN KGS.	DRAWING No.	ITEM No.
REFERENCE:			COMPONENT CODE: 08	EQUIPMENT CODE: 19		
SCALE	DRAWN	ALTERATIONS:				
2:1	CHECKED	DCN REF				
	APPROVED	DATE				
	DATE	SIGN.				
	MACHINE: HORIZONTAL BORING	TYPE: HB617-UTA160P				
	TITLE: PINION ø54X70T (D'ANDREA FACING HEAD ASSY.)	DRAWING No: 19 4-M-01B-26411				REV.
		No. of Sheets:				Sheet No:

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CAUTION:

ALL DIMENSIONS ARE IN MM

ø6H7	+0.012	1.6P9	-0.009	3.2	√/1.6	√
	+0.000		-0.034			
ø43.4h11	-0.000					
	-0.160					



NO. OF TEETH	56
MODULE	0.75
PRESSURE ANGLE	20°
WIDTH ACROSS 7 TEETH	14.9798 -0.113 -0.130
CORRECTION FACTOR	NIL
QTY. & TOL. ZONE	9c DIN 3967
MATING GEAR NO. OF TEETH	14
MATING GEAR DRAWING NO.	4-M-01B-26410
CENTRE DISTANCE	25.45

ø43.4X7L		45C8	IS: 7283	0.07	1-M-01B-02481	34
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT. IN KGS.	DRAWING No.	ITEM No.
REFERENCE:			COMPONENT CODE: 08	EQUIPMENT CODE: 19		
		ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX
SCALE	DRAWN	R. Narayanan Bay.				
2:1	CHECKED					
	APPROVED					
	DATE	26.04.99				
MACHINE: HORIZONTAL BORING			TYPE: HB 617 UTA-160P			
TITLE: SPUR GEAR ø43.4X56T (D'ANDREA FACING HEAD ASSY.)			DRAWING No: 19		REV.	
			4-M-01B-26415			
			No. of Sheets:		Sheet No:	

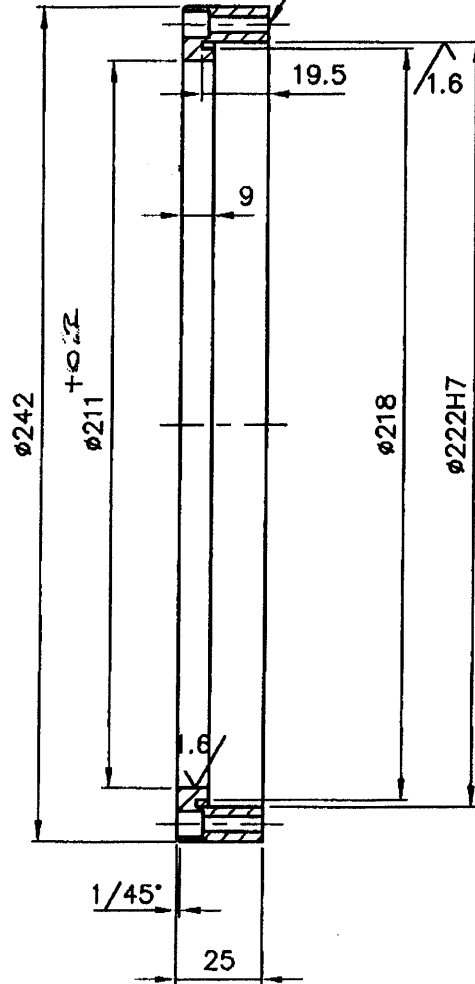
THIS DRAWING IS OUR SOLE PROPERTY AND SHOULD NOT BE USED IN ANY FORM FOR ANY PURPOSE WITHOUT THE WRITTEN PERMISSION OF BHARAT HEAVY ELECTRICALS LIMITED TRICHURAPPALLI - 620 014.

CAUTION:

ALL DIMENSIONS ARE IN MM

ø222H7	+0.046	3.2//1.6//	✓/✓/✓
	+0.000		

6 HOLES ø4.5/CBR ø7.5 - 5 DEEP
ON PCD 232



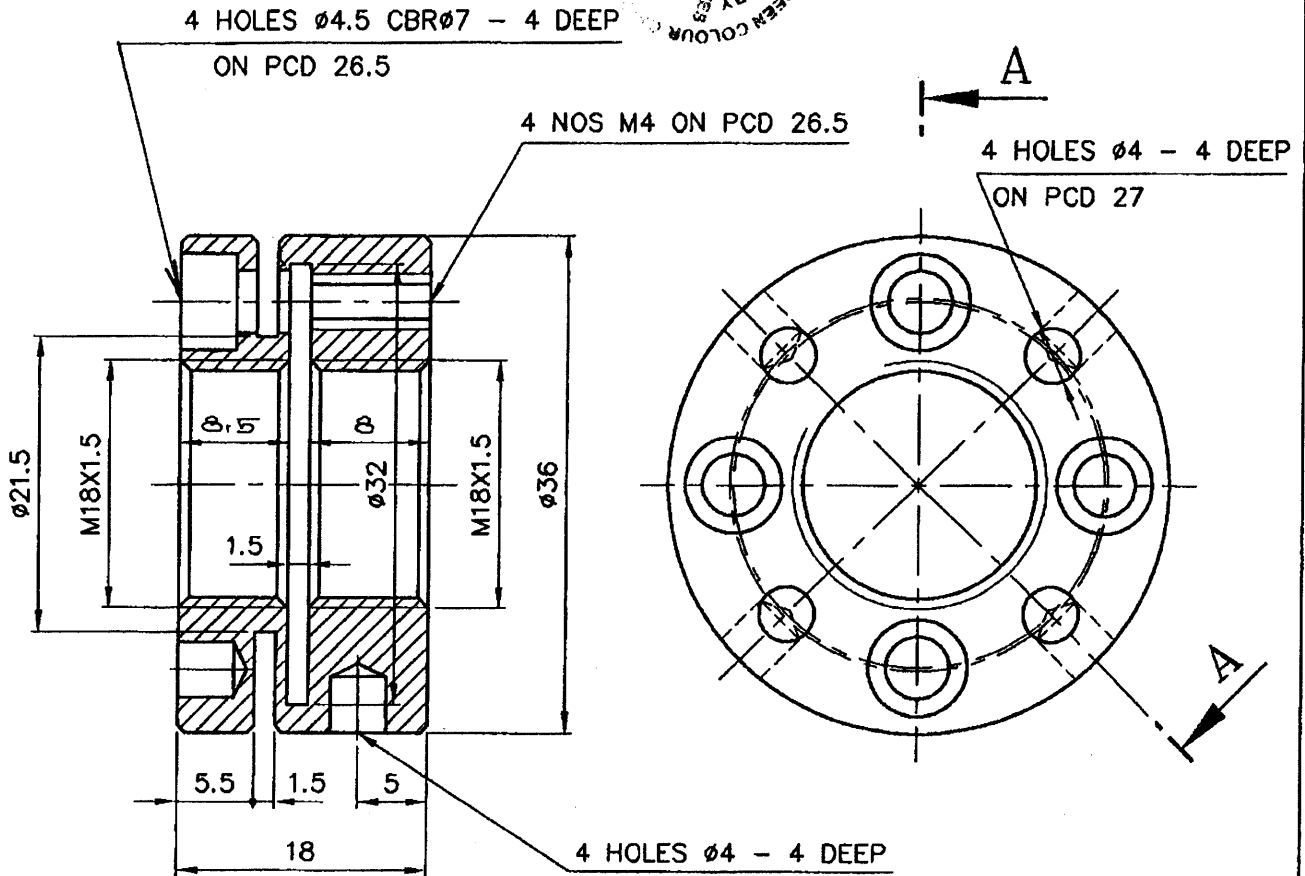
	ø242X25t	45C8	IS: 7283	2, 23	1-M-01B-02481	28
X						
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
REFERENCE:			COMPONENT CODE: 00	EQUIPMENT CODE: 19		
SCALE	DRAWN		ALTERATIONS:	DCN REF	DATE	SIGN.
1:2	CHECKED	<i>R. Narayanan</i>				
	APPROVED					
	DATE	19.06.99				
	MACHINE: HORIZONTAL BORING	TYPE: HB 617-UTA 160P				
	TITLE: RING (D'ANDREA FACING HEAD ASSY.)	DRAWING No: 19 4-M-01B-26449				REV.
	No. of Sheets:	Sheet No:				

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ALL DIMENSIONS ARE IN MM



3.2 / / /



NOTE: -

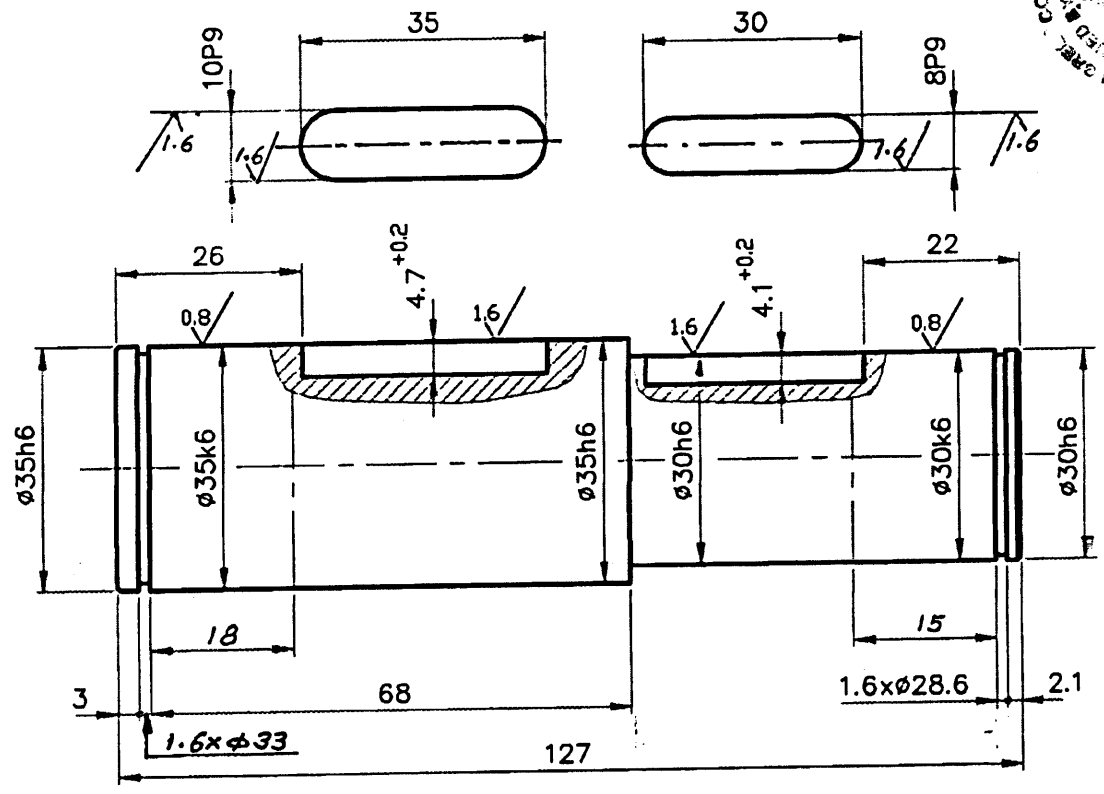
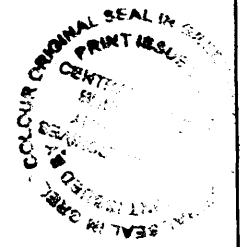
ALL CORNERS TO BE CHAMFERED FOR 0.5/45°

	$\phi 36 \times 18L$	45C8	IS: 7283	0.11	1-M-01B-02481	61
X						
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
REFERENCE:	SPIETH DESIGN		COMPONENT CODE: 24	EQUIPMENT CODE: 19		
SCALE	DRAWN	<i>R. Narayanan</i>	ALTERATIONS:	DCN REF	DATE	SIGN.
2:1	CHECKED	<i>[Signature]</i>				
	APPROVED	<i>[Signature]</i>				
	DATE	15.07.99				
MACHINE: HORIZONTAL BORING			TYPE: HB 617-UTA 160P			
TITLE: LOCK NUT M18X1.5 (D'ANDREA FACING HEAD ASSY.)			DRAWING No: 19		REV.	
No. of Sheets			Sheet No			



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ALL DIMENSIONS ARE IN MM		$\phi 30k6$	+0.015 +0.002	$\phi 30h6$	-0.000 -0.013	$3.2/\sqrt{\quad}$ $1.6/\sqrt{\quad}$ $0.8/\sqrt{\quad}$
8P9 10P9	-0.015 -0.051	$\phi 35k6$	+0.018 +0.002	$\phi 35h6$	-0.000 -0.016	



HEAT TREAT TO 90 KG/CM²
AVOID SHARP CORNERS

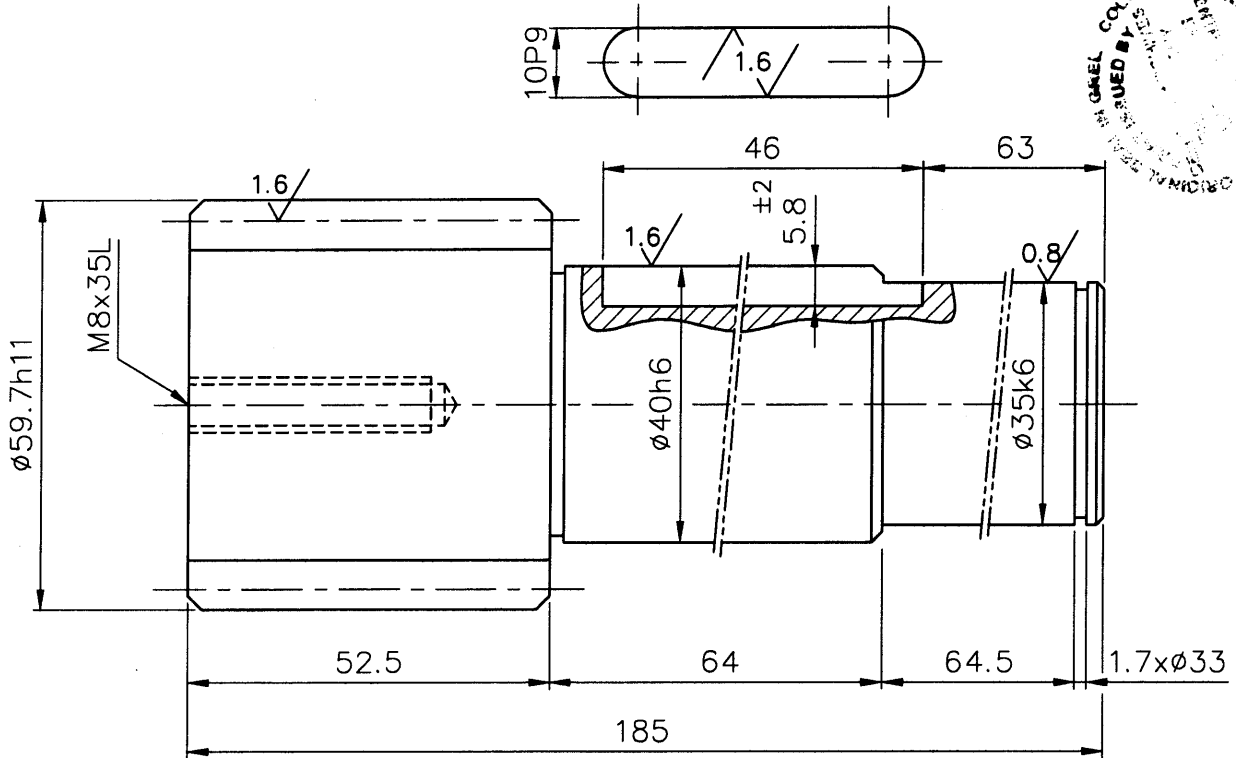
CL IV		IS:1875	0.130	D.M. 016-0082	05		
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT. IN KGS.	DRAWING No.	ITEM No.	
REFERENCE:		COMPONENT CODE: 01	EQUIPMENT CODE: 19				
SCALE	DRAWN	CERoy	ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX
1:1	CHECKED	R. Ramanath					
	APPROVED	<i>[Signature]</i>					
	DATE	20/07/94					
MACHINE: HORIZONTAL BORING CNC			TYPE: HB 617 UTA160P				
TITLE: SHAFT (OD35x127L)			DRAWING No: 4-M-01B-25321		REV.		
			No. of Sheets: 19		Sheet No:		

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ALL DIMENSIONS ARE IN MM

ø59.7h11	-0.000	ø40h6	-0.000
	-0.190		-0.016
10P9	-0.015	ø35k6	+0.018
	-0.051		+0.020

3.2//1.6//0.8/



NO.OF TEETH	17
MODULE	3
PRESSURE ANGLE	20°
WIDTH ACROSS 3 TEETH	23.77 ^{-0.141} -0.188
CORRECTION FACTOR	+0.45
QLTY.&TOL.ZONE	9C DIN 3967
MATING GEAR NO.OF TEETH	-
MATING GEAR DRAWING NO:	-
CENTRE DISTANCE	-

NOTE: -

CHAMFER CORNERS FOR 1.5/45°

HARDEN TO HRC 35 ^{±2}

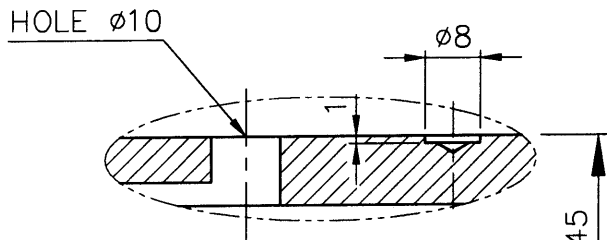
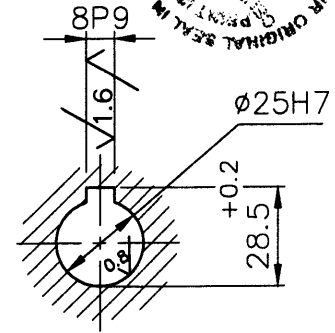
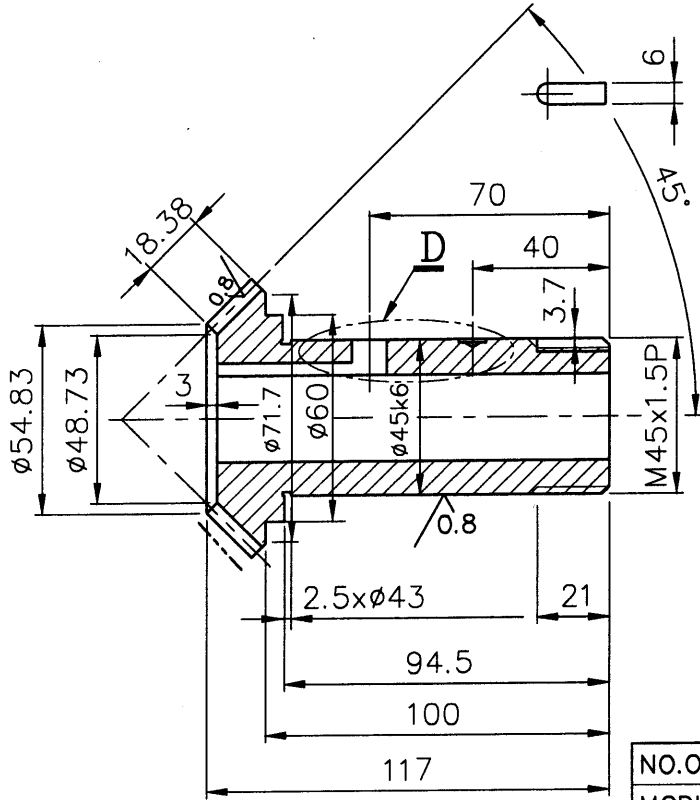
□	ø60x185L	55C8	IS: 5517	2.85		
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE:	ALTERATIONS:		DCN REF	DATE	SIGN. INDEX
SCALE 1:1	DRAWN	S.Selvamanickam				
	CHECKED	R.Ramamoothy				
	APPROVED	C.S.Jayasheelan				
	DATE	29.04.10'				
	MACHINE: HORIZONTAL BORING CNC		TYPE: UTA 160P			
	TITLE: PINION SHAFT 17T/ø59.7 (TABLE DRIVE UNIT.)		DRAWING No:			REV.
			4M01B1928534			
			Sheet No:			No. of Sheets:

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ALL DIMENSIONS ARE IN MM

ø45k6	+0.018	ø25H7	+0.021
	+0.002		0.000
8P9	-0.015		-0.051
	-0.051		

1.6//0.8



DETAIL-D

NO. OF TEETH	26
MODULE	3
PRESSURE ANGLE	20°
HAND OF HELIX	LH
SPIRAL ANGLE (KLINGELNBERG)	35°
SHAFT ANGLE	90°
MATING GEAR NO. OF TEETH	26
MATING GEAR DRAWING NO.	4M01B1929159

NOTE: - ±2
 CASE HARDENED TO HRC 58

CASE DEPTH 0.8mm

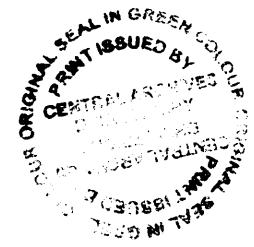
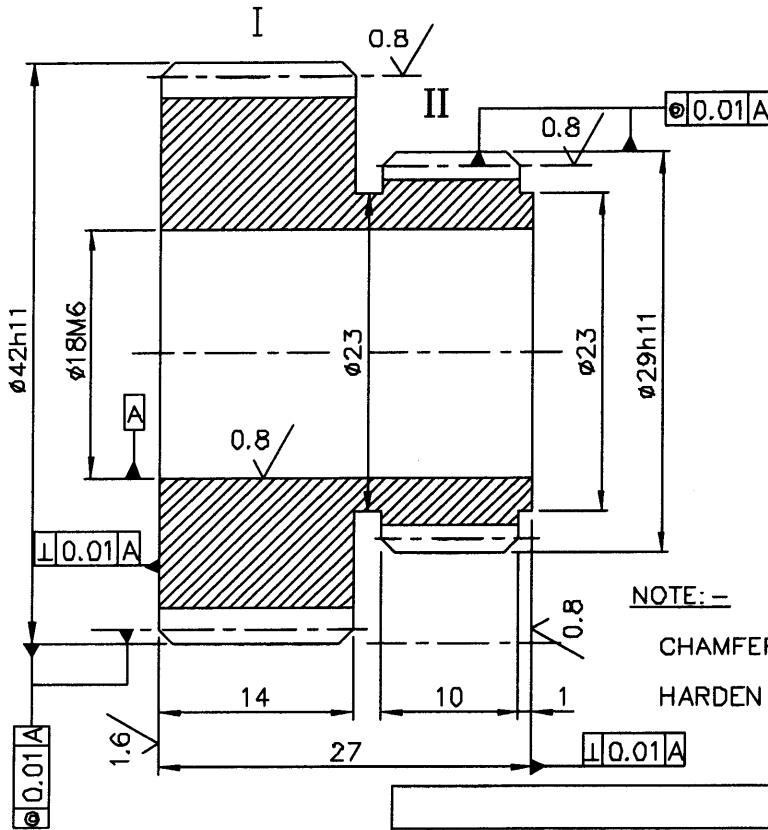
CHAMFER CORNERS FOR 1/45°

OD83x117L		13Ni13Cr.3	IS: 4432	1.45		
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT. IN KGS.	DRAWING No.	ITEM No.
	REFERENCE:		ALTERATIONS:	DCN REF	DATE	SIGN. INDEX
SCALE	DRN. S.Selvamanickam					
1:2	CHED. R.Ramamoorthy					
1:1	APPD. C.S.Jayasheelan					
	DATE 19.12.11'					
MACHINE: HORIZONTAL BORING CNC			TYPE: HB617-UTA 160P			
TITLE: SPIRAL BEVEL GEAR -26T (TABLE DRIVE)			DRAWING No:			REV.
			4M01B1929160			
			Sheet No:			No. of Sheets:

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ALL DIMENSIONS ARE IN MM

ø29h11	-0.000	ø18M6	-0.007	3.2//1.6/0.8
	-0.130		-0.018	
ø42h11	-0.000			
	-0.160			



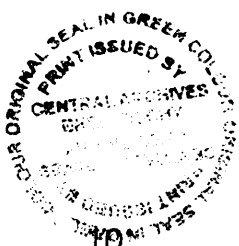
NOTE: -
CHAMFER SHARP CORNERS TO 1/45°
HARDEN & TEMPER TO 60 HRC

	I	II
NO.OF TEETH	40	27
MODULE	1	1
PRESSURE ANGLE	20°	20°
WIDTH ACROSS 5 TEETH (I) 4 TEETH (II)	13.8447 ^{-0.056} _{-0.094}	10.7105 ^{-0.056} _{-0.094}
CORRECTION FACTOR	NIL	NIL
QTY.&TOL ZONE	9e DIN 3967	9e DIN 3967
MATING GEAR NO.OF TEETH	160	18
MATING GEAR DRAWING No.	3.M.01B19.11790	4.M.01B19.26252
CENTRE DISTANCE	100	22.5

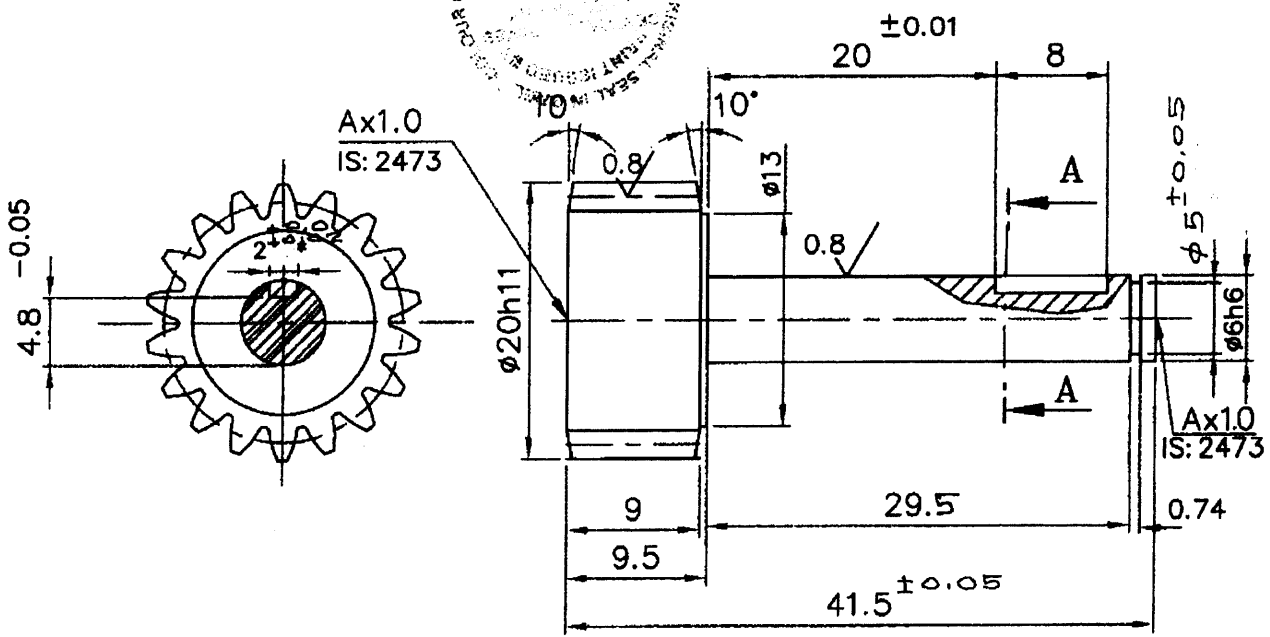
ø42x27L		40Ni6Cr4Mo2	IS: 5517	0.20		
					3.M.01B19.12790	04
No of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM NO.
	REFERENCE:	ALTERATIONS:		DCN REF	DATE	SIGN.
SCALE	DRAWN	TOLERANCE & CONCENTRICITY ADDED			14.10.06	01
2:1	CHECKED					
	APPROVED					
	DATE					
MACHINE: HORIZONTAL BORING			TYPE: HB617-UTA 160P			
TITLE: DOUBLE GEAR			DRAWING No:		REV.	
(D' ANDREA FACEING HEAD)			4M01B192639401			
			Sheet No:		No.of Sheets:	

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ALL DIMENSIONS ARE IN MM



6h6	-0.000	3.2/1.6/0.8
	-0.008	
20h11	-0.000	
	-0.030	



NO. OF TEETH	18
MODULE	1
PRESSURE ANGLE	20°
WIDTH ACROSS 3 TEETH	7.6324 -0.036 -0.059
CORRECTION FACTOR	NIL
QLTY. & TOL. ZONE	De DIN 3967
MATING GEAR NO. OF TEETH	27T
MATING GEAR DRAWING NO:	4-M-01B-26394
CENTRE DISTANCE	22.5 ±0.05

NOTE:

* THE KEY WAY ORIENTATION SHOULD BE AT THE CENTRE OF THE GEAR TOOTH AS SHOWN IN DRAWING

HARDENED TO HRC 45 ± 2

X		20x42L	SSC8	IS: 5512	0.03	4-M-01B-02481	15
No. of Pieces	DESCRIPTION		MATERIAL	STANDARD	NET.WT. IN KGS.	DRAWING No.	ITEM No.
REFERENCE:				COMPONENT CODE: 08		EQUIPMENT CODE: 19	
			ALTERATIONS:		DCN REF	DATE	SIGN.
SCALE	DRAWN	m.kumaravel	MATERIAL WAS SA 192 F22			17/9/01	R.R.
	CHECKED	R. Ramamonig.					
	APPROVED						
	DATE	18-11-99					
MACHINE: HORIZONTAL BORING				TYPE: HB 617-UTA160P			
TITLE: PINION SHAFT [18TX20x41.5L]				DRAWING No: 4-M-01B-26252 19		REV.	
				No. of Sheets		Sheet No.	

