



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
1/3

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

	Enquiry No	Enquiry Date	Due Date for Quotation
	2661400338 - 55	15.05.2014	09.06.2014
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	7504B1704800 SPUR GEAR AS PER GRG.NO. 3M-04B-17-9847 NOTE: SL.NO. 10 AND 20 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 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	10.000	10.00	14.07.14
20	7504B1704900 SPUR GEAR AS PER GRG.NO. 3M-04B-17-9848	NO	10.000	10.00	14.07.14
30	7504B1703600 SPUR GEAR AS PER DRG NO: 3M 04B 17 9849 NOTE: SL.NO. 30 TO 70 ARE MATING COMPONENTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	10.000	10.00	14.07.14
40	7504B1703700 SPUR GEAR AS PER DRG NO: 3M 04B 17 9850	NO	10.000	10.00	14.07.14
50	7504B1706600 SHAFT-IV AS PER DRG. NO. 3M-04B-17-9854	NO	10.000	10.00	14.07.14
60	7504B1704700	NO	10.000	10.00	14.07.14

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,



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Web:

2661400338 / 15.05.2014

SHAFT-V AS PER GRG. NO. 3M-04B-17-9855

70	7504B1705000 SHAFT-VI AS PER GRG. NO. 3M-04B-17-9856	NO	10.000	10.00	14.07.14
80	7504B1703300 SHAFT-III AS PER DRG. NO. 3M 04B 17 9853	NO	10.000	10.00	14.07.14
90	7504B1704400 SHAFT-VII AS PER GRG.NO. 3M-04B-17-9857	NO	10.000	10.00	14.07.14
100	7504B1703400 DOUBLE GEAR AS PER DRG. NO. 3M 04B 17 10837-01	NO	10.000	10.00	14.07.14
110	7504B1704600 SPLINE SHAFT-II AS PER GRG.NO. 3M-04B-17-10838-01	NO	10.000	10.00	14.07.14
120	7504B1706700 SPLINE SHAFT- IV AS PER GRG. NO. 3M-04B-17-10839-01	NO	10.000	10.00	14.07.14
130	7504B1706800 SPLINE SHAFT-V AS PER GRG. NO. 3M-04B-17-10840-01	NO	10.000	10.00	14.07.14
140	7504B1704300 SHAFT AS PER GRG.NO. 3M-04B-17-12168	NO	5.000	5.00	14.07.14
150	7504B1706900 ECCENTRIC SHAFT AS PER GRG. NO. 3M-04B-17-12222	NO	2.000	2.00	14.07.14
160	7504B0307300 ECCENTRIC SHAFT AS PER DRG NO: 3M-04B-03-3783-01	NO	10.000	10.00	14.07.14

General Note:

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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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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PURCHASE DEPARTMENT - FOSSIL BOILERS
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2661400338 / 15.05.2014

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

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
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opening.Late and delayed offers are liable to be rejected.

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"

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 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 RsLacs is within permissible limit of
Rs..... Lacs for Micro 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
(dclimiyyyy) 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 -

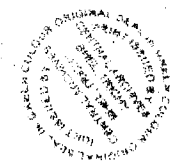
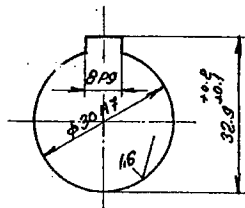
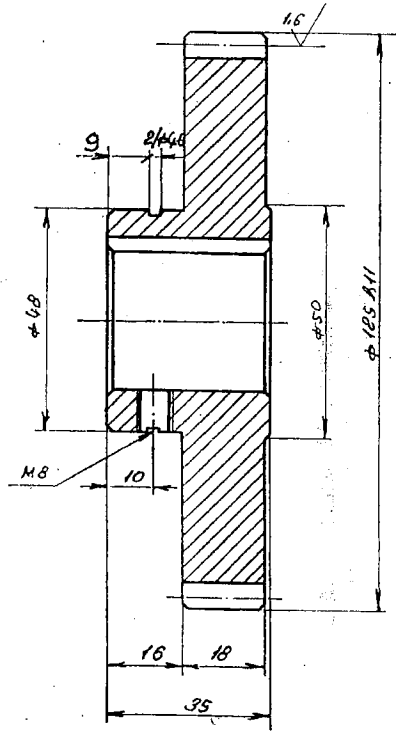
Seal of Chartered Accountant

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CAUTION
 THIS DRAWING IS OUR SOLE PROPERTY AND SHOULD NOT BE USED IN ANY FORM FOR ANY OTHER PURPOSE WITHOUT THE WRITTEN PERMISSION OF BHARAT HEAVY ELECTRICALS LTD., TRICHY/AP/111 - 220 01A.

3.2 // 15 //

✓	B 29	-0.015
✓	+30H7	+0.000
✓	+125H11	-0.250



NO. OF TEETH	48
MODULE	2.5
PRESSURE ANGLE	20°
WIDTH ACROSS 6 TEETH	42.27 ^{-0.158} / _{-0.210}
CORRECTION FACTOR	—
QTY. & TOL. ZONE	30 DIN 3967
MATING GEAR NO. OF TEETH	46
MATING GEAR DRG NO.	3-M-048-9848
CENTRE DISTANCE	117.5

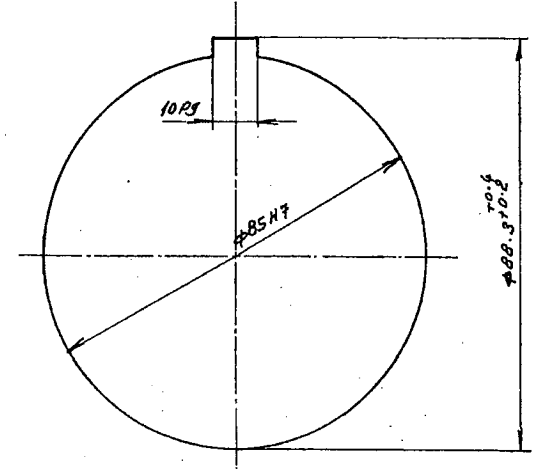
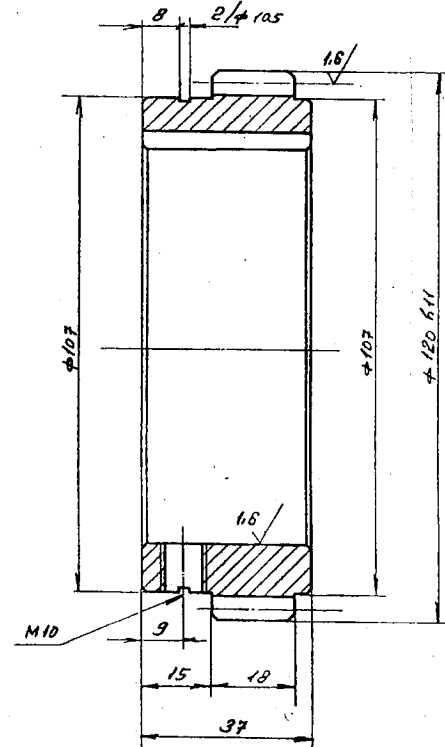
NOTE:
 CASE HARDENED TO HRC 62±2
 CASE DEPTH 0.8mm
 EDGES CHAMFERED TO 1/45°

No. OF PICES		DESCRIPTION		SEM-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP	NET WT	CROSS WT	DRAWING No.	ITEM No.
					13 N:3018 15.6632						
REMARKS						TOTAL NET WL (kg)					
SCALE	DRAWN	CHECKED	APPROVED	STDS. OFFICER	DATE	ALTERATIONS	DATE	SIGNATURE	INDEX		
1:1	A. Babu	K. S. B. Ramy			17-05-87						
MACHINE: RADIAL DRILLING						TYPE: DRF 10, VR10					
TITLE: SPUR GEAR ϕ 125H11/48T						DRAWING No. 3-M-048-9847					
No. OF SETS:						SHEET No.					

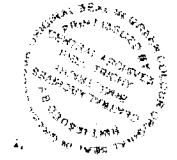
39 - 609

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3.2 // 1.6 //



✓ 10.25	-0.015
✓ 85H7	+0.035
✓ 120H11	-0.220



CASE HARDENED TO HRC 62[±]2
 CASE DEPTH 0.8mm
 EDGES TO BE CHAMFERED 1/45°

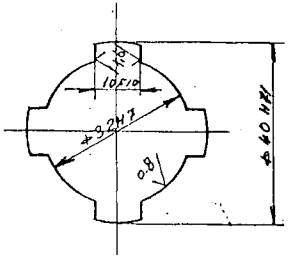
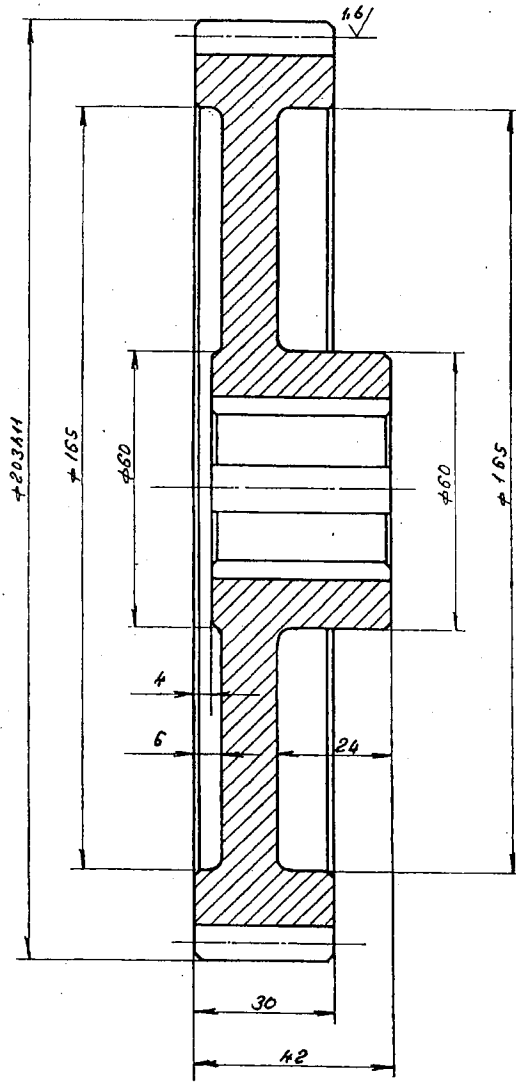
NO. OF TEETH	46
MODULE	2.5
PRESSURE ANGLE	20°
WIDTH ACROSS 6 TEETH	42.20 ^{-0.158} -0.210
CORRECTION FACTOR	—
QTY. & TOL. ZONE	9c DIN 3967
MATING GEAR NO. OF TEETH	48
MATING GEAR DRG. NO.	3-M-046-9847
CENTRE DISTANCE	117.5

13 Ni 3Cr00 1S:6632		D.M-046-0763 12							
No. OF PIECES	DESCRIPTION	SEM-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP PART	NET WT	GROSS WT	DRAWING No.	ITEM No.
REMARKS								TOTAL NET WT. (kg)	
SCALE	DRAWN	REFERENCE		ALTERATIONS		DATE	SIGNATURE	INDEX	
1:1	A. Balan	R. W. B. Sanyal							
	APPROVED								
	STDL. OFFICER								
	DATE	12.05.87							
MACHINE: RADIAL DRILLING				TYPE: 3RT 10					
TITLE: SPUR GEAR ϕ 120H11/46T [SHAFT II]				DRAWING No. 3-M-046-9848					
No. OF SHEETS				SHEET No.					

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3.2 / 1.6 / 0.8



✓	10.10	+0.013
		+0.071
✓	+32H7	+0.025
		+0.000
✓	+40H11	+0.160
		+0.000
✓	+203H11	+0.000
		+0.290

NO. OF TEETH 56
 MODULE 3.5
 PRESSURE ANGLE 20°
 WIDTH ACROSS 7 TEETH 69.91 -0.158
 CORRECTION FACTOR -0.810
 QTY. R/TOL. ZONE 9c DIN 3967
 MATING GEAR NO. OF TEETH 20
 MATING GEAR DRS NO. 3-M-046-9850
 CENTRE DISTANCE 139

CASE HARDENED TO HRC 62±2
 CASE DEPTH 0.8mm
 EDGES TO BE CHAMFERED 1/45°

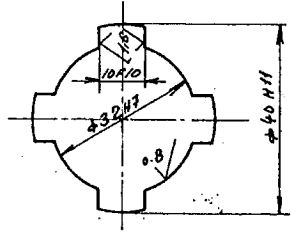
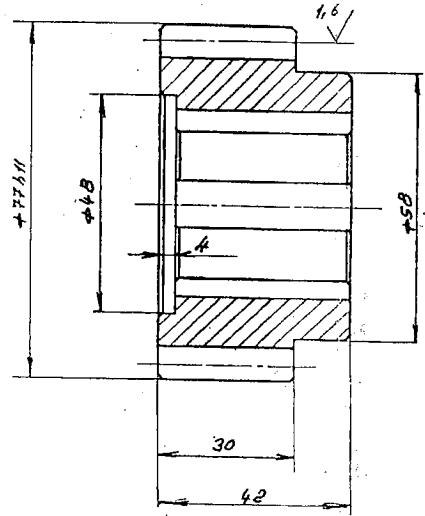
		13N13C80						D-M-046-0783 22	
		15:4632							
No. OF PIECES	DESCRIPTION	SEM-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP	NET WT	CROSS WT	DRAWING No.	ITEM No.
REMARKS				TOTAL NET WL (kg)					
SCALE	DRAWN	REFERENCE		ALTERATIONS		DATE	SIGNATURE	INDEX	
1:1	A. Babu	K. U. B. Sarany							
	APPROVED								
	STDS. OFFICER								
	DATE	12.05.83							
MACHINE: RADIAL DRILLING			TYPE: DAT 10/DR10						
FILE: SPUR GEAR φ203H11/56T			DRAWING No. 3-M-046-9849						
[SHAFT V]			No. OF SHEETS: 1			SHEET No.			

39 - 609

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3.2 / 16 / 0.8 /

✓ 10F10	+0.013
	-0.021
✓ \pm 32H7	+0.025
	+0.000
✓ \pm 40H11	+0.050
	+0.000
✓ \pm 77H11	+0.000
	-0.050



NO. OF TEETH 20
 MODULE 3.5
 PRESSURE ANGLE 20°
 WIDTH ACROSS 3 TEETH 26.81 $\frac{-0.161}{-0.188}$
 CORRECTION FACTOR —
 QTY. & TOL. ZONE 90 DIN 3967
 MATING GEAR NO. OF TEETH 58
 MATING GEAR DRG NO. 3-M-046-9849
 CENTRE DISTANCE 133

CASE HARDENED TO HRC 62±2
 CASE DEPTH 0.8mm
 EDGES TO BE CHAMFERED 1/65°

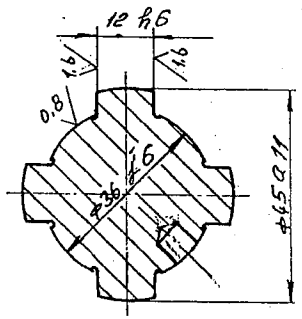
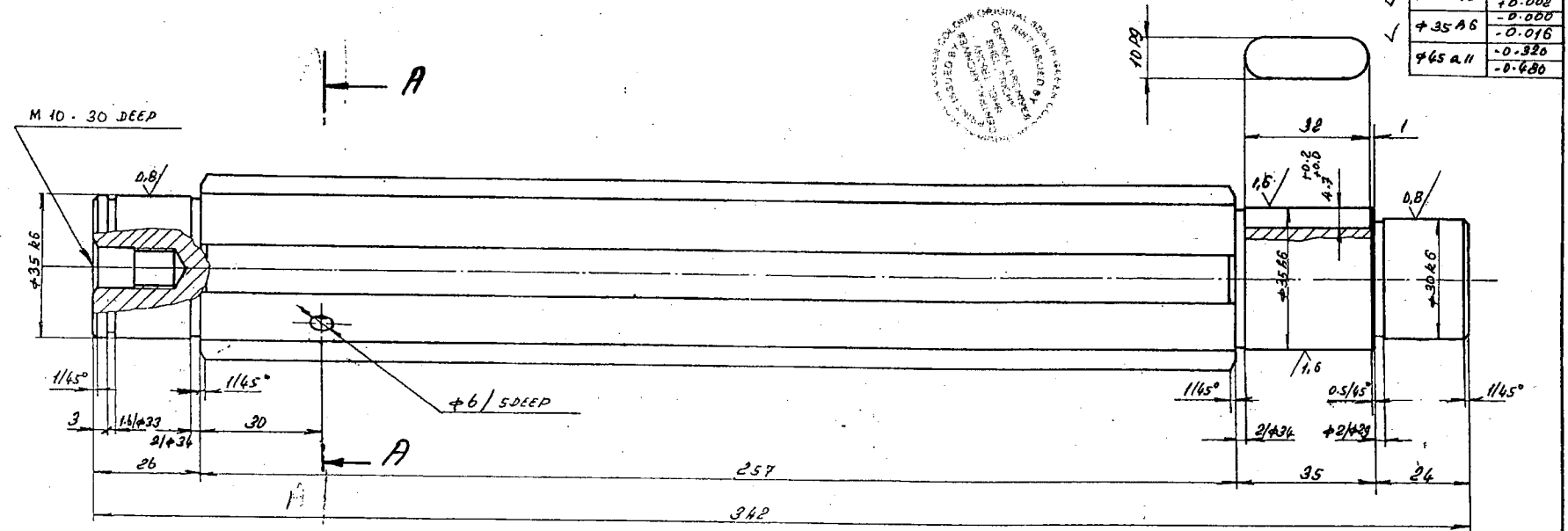
		13Ni8Cr80					0-M-046-0763 21	
No. OF PIECES	DESCRIPTION	SEM-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SHRT	NET WT	GROSS WT	DRAWING No.
REMARKS			TOTAL NET WT. (kg)					
SCALE	DRAWN	CHECKED	APPROVED	STDS. OFFICER	DATE	ALTERATIONS		DATE
1:1					17.05.87			SIGNATURE
MACHINE: RADIAL DRILLING		TYPE: DRT 10/DR10		DRAWING No.		3-M-046-9850		
TITLE: SPUR GEAR \pm 77H11/20T [SHAFT IN]				No. OF SHEETS:		SHEET No.		

39 - 609

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 MISSION OF BHARAT HEAVY ELECTRICALS LTD.,
 TRICHYAPAZHAI - 620 016.

3.2 / 1.6 / 0.8

12 A 6	-0.000	10 A 9	-0.015
	-0.061		-0.051
± 36 J 6	-0.005	± 30 K 6	+0.015
	+0.011		+0.002
		± 35 K 6	+0.018
			+0.002
		± 35 A 6	-0.000
			-0.016
		± 65 A 11	-0.320
			-0.680



SECTION A-A

NOTE: SPINED PORTIONS HARDENED TO HRC 42 ± 2

		C 55 Mn 78 IS: 5517				D-M-04b-0763 3	
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP PART	NET WT	GROSS WT
REMARKS				TOTAL NET WT. (kg)			
SCALE	DRAWN	REFERENCE		ALTERATIONS		DATE	SIGNATURE
1:1	CHECKED						
	APPROVED						
	STDS. OFFICER						
	DATE	17-05-87					
MACHINE: RADIAL DRILLING		TYPE: DRT 10					
TITLE: SHAFT - III (SPEED BOX)		DRAWING No. 3-M-04B-9853					
No. OF SHEETS: 1		SHEET No.					

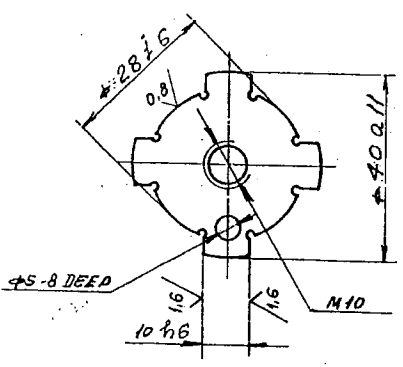
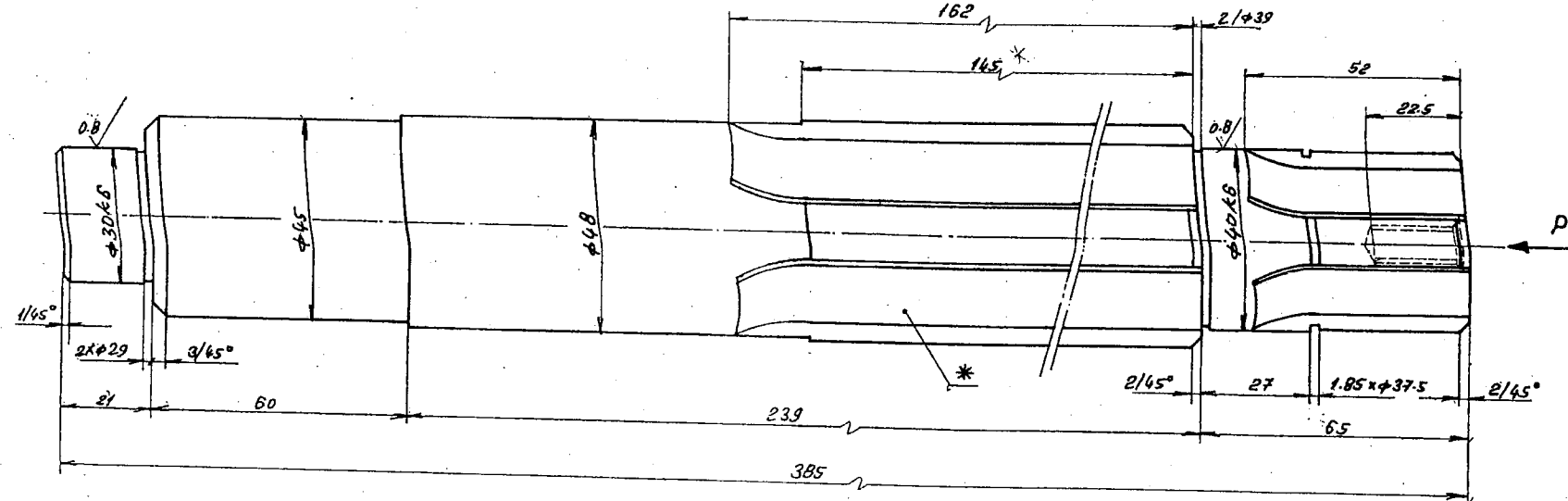
80

39 - 609

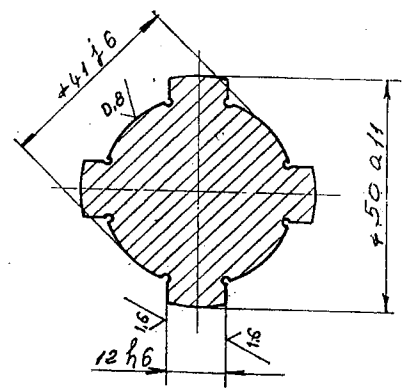
CAUTION
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1216	-0,000	10 R 6	-0,000	φ 30k6	+0,015	✓
	-0,011		-0,009		+0,008	
φ 50a11	-0,320	φ 28j6	+0,009	φ 40k6	+0,018	✓
	-0,480		-0,006		+0,022	
		φ 40a11	-0,310	φ 41j6	+0,011	
			-0,470		-0,005	

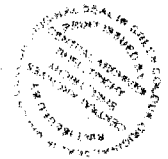
32 / 16 / 08



VIEW 'P'



SECTION 'A-A'



NOTE :-
 * SPLINED PORTION HARDENED TO HRC 42 ± 2

		C55 Mn75				D-M-046-0763		5
		IS: 5517						
No. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP WT	NET WT	GRUES WT	DRAWING No.
REMARKS				TOTAL NET WT. (kg)				
SCALE	DRAWN	REFERENCE	ALTERATIONS		DATE	SIGNATURE	INDEX	
1:1	W. Babu							
	CHECKED							
	APPROVED							
	STDS. OFFICER							
	DATE	17-05-87						
MACHINE: RADIAL DRILLING			TYPE: DRT/D					
TITLE: SHAFT- V (SPEED BOX)			DRAWING No. 3-M-046-9855					
			No. OF SHEETS:		SHEET No.			

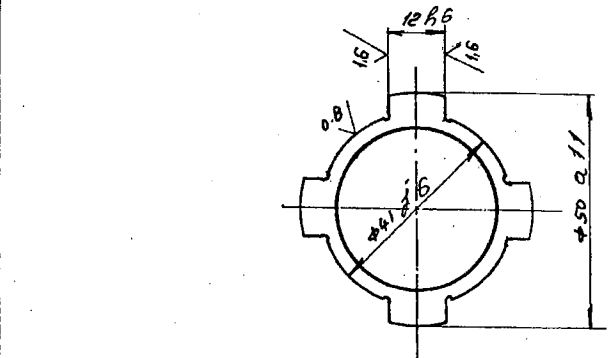
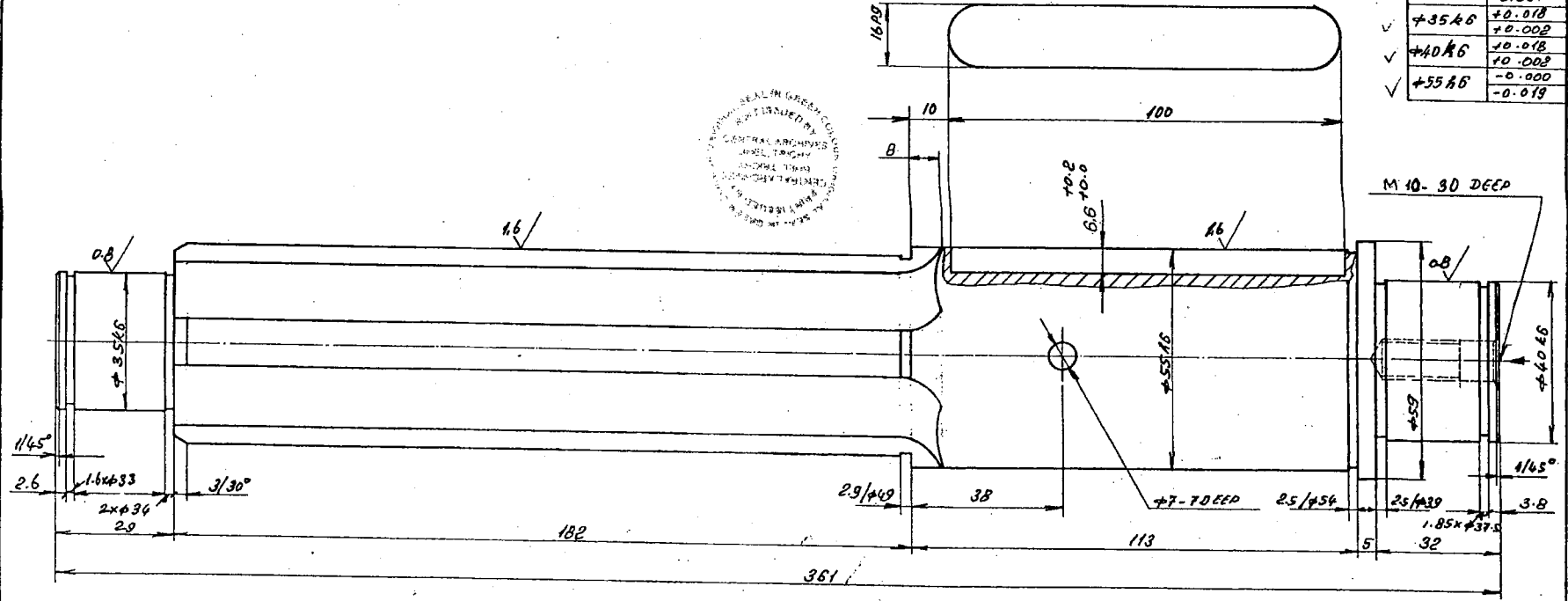
39 - 609

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12 h6	-0,000
	-0,011
+41j6	+0,011
	-0,005
+50a11	-0,320
	-0,480

3.2 / 1.6 / 0.8

16P9	-0.018
	-0.031
+35k6	+0.018
	+0.002
+40h6	+0.018
	+0.003
+55h6	-0.000
	-0.019



NOTE:-
 SPLINED PORTION HARDENED TO HRC 42±2

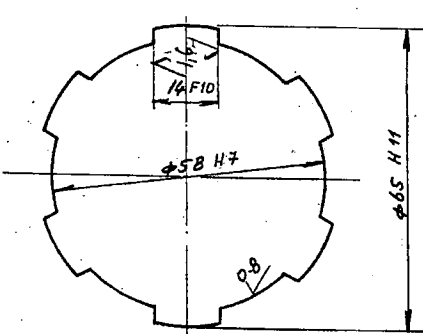
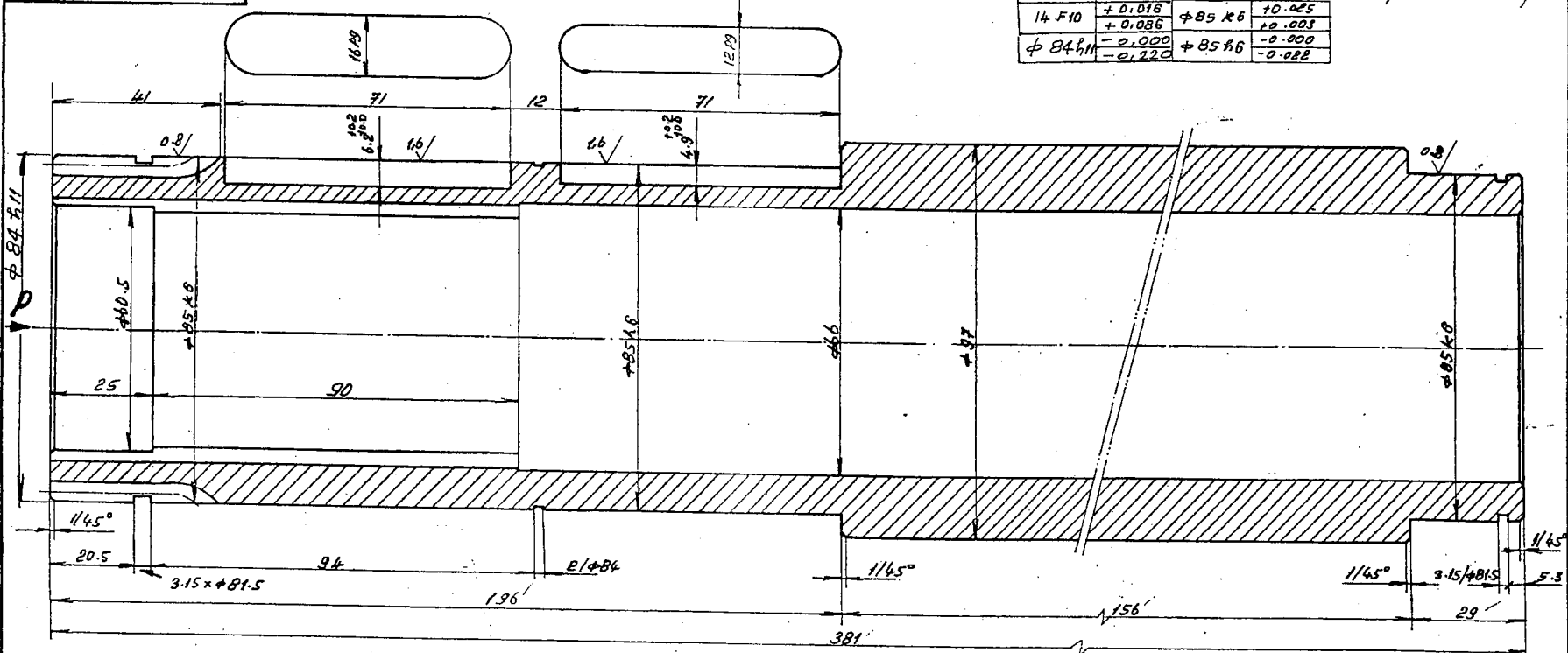
		C55Mn75				D-M-04b-0763 6	
		IS: 5517					
No. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	DRAWING No.
REMARKS				TOTAL NET WL (kg)			
SCALE	DRAWN	REFERENCE		ITERATIONS		DATE	SIGNATURE
	CHECKED						
	APPROVED						
	STDS. OFFICER						
	DATE	12-05-87					
MACHINE: RADIAL DRILLING		TYPE: DET 10					
TITLE: SHAFT - VI		DRAWING No. 3-M-04B-9856					
(SPEED BOX)		No. OF SHEETS:		SHEET No.			

39 - 609

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φ 58 H7	+0.030	16 P9	-0.018
	+0.000		-0.061
φ 65 H11	+0.190	12 D9	-0.018
	+0.000		-0.061
14 F10	+0.018	φ 85 K6	+0.025
	+0.086		+0.003
φ 84 h11	-0.000	φ 85 K6	-0.000
	-0.220		-0.082

3.2 / 1.6 / 0.8



GEAR DATA

NO OF TEETH	14	WIDTH ACROSS 5 TEETH	27.59
MODULE	2	QTY. & TOL. ZONE	30 DIM 3967
PRESSURE ANGLE	20°	MATING GEAR NO. OF TEETH	50
CORRECTION FACTOR	-	MATING GEAR DEG. NO.	
		CENTRE DISTANCE	90

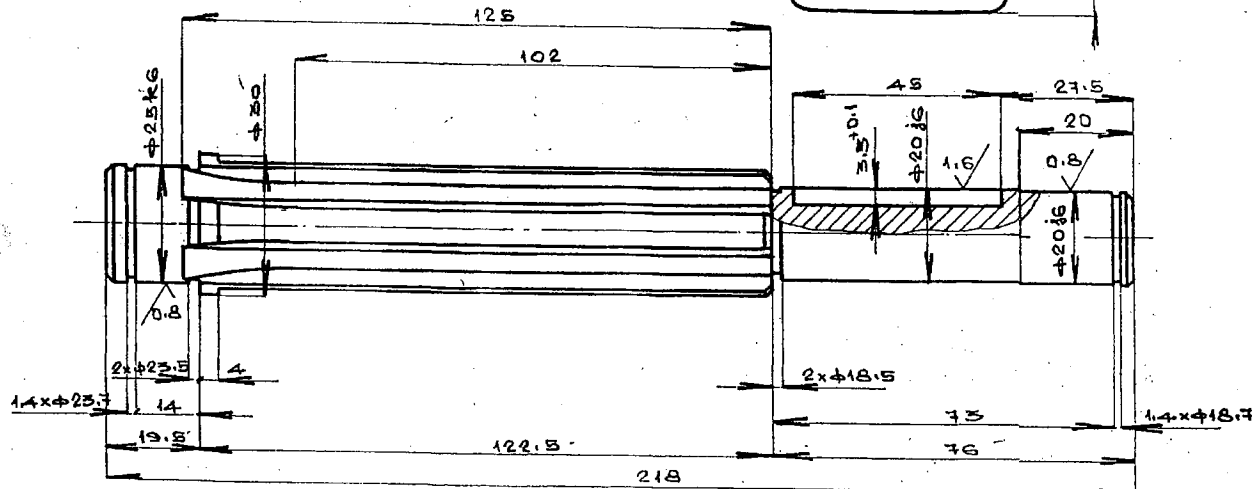
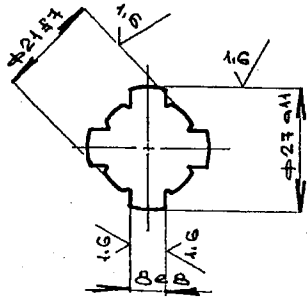


C 55.MN75		0-M-046-0763 7	
15:5517			
NO. OF PIECES	DESCRIPTION	SCH. - PRODUCT	FINAL MATERIAL
REMARKS	TOTAL NET WL (kg)		
SCALE	DRAWN	REFERENCE	ALTERATIONS
1:1	K. U. B. Sanyal		DATE SIGNATURE INDEX
CHECKED			
APPROVED			
STDS. OFFICER			
DATE	17.05.87		
MACHINE: RADIAL DRILLING		TYPE: DRT 10	
TITLE: SHAFT - VII (SPEED BOX)		DRAWING No. 3-M-046-9857	
No. OF SHEETS:		SHEET No.	

39-609 A

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GP9	-0.012	+20 \pm 6	+0.009	+21 \pm 7	-0.020	3/2 1.6 0.8
	-0.042		-0.004		-0.041	
BEB	-0.025			+27 \pm 11	-0.010	
	-0.047				-0.470	
		+25 \pm 6	+0.015			
			+0.002			



CHAMFER CORNERS FOR 1/45°
HARDENED TO HRC 28±2

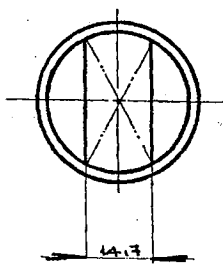
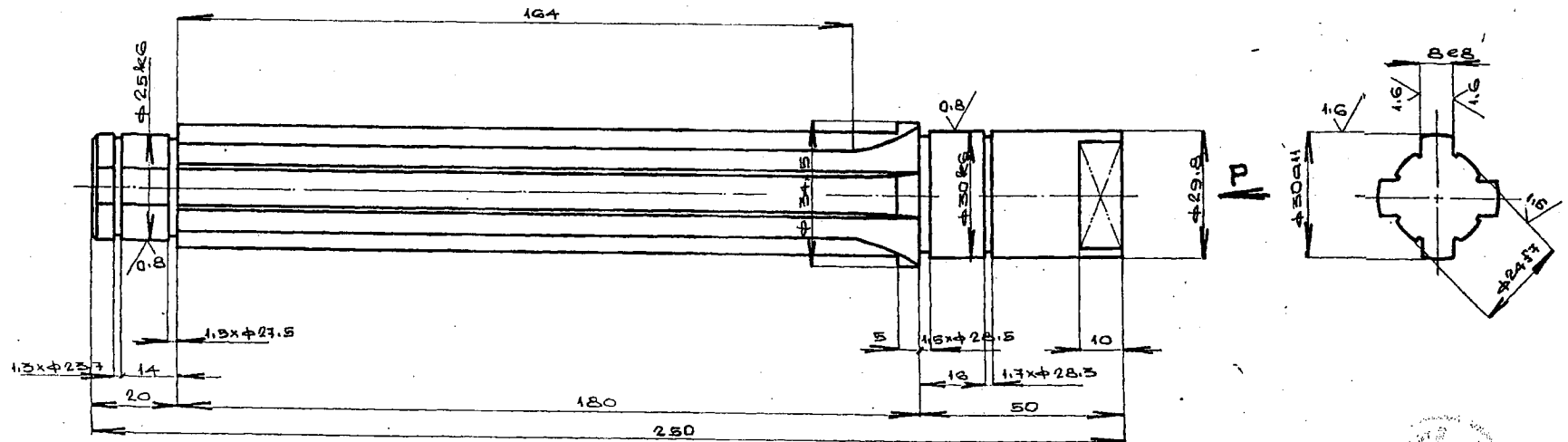
REFERENCE ONLY
NOT FOR MANUFACTURE
Sigs: ... Date: ...

No. of Pcs		DESCRIPTION		MATERIAL	STD/BPS	No. of Cross wt. (kg)	wt. (kg)	DRAWING No.	Item No.
		55C-6 15:5517		1.93			1-M.04b.2160	03	
REFERENCE :				ALTERATIONS		DATE	SIGN.	Index	
				WT ADDED		20.043	ka	01	
SCALE	DRAWN	CHECKED	APPROVED	DATE					
1:1				09061991					
MACHINE : RADIAL DRILLING				TYPE : DRT-10.		Total wt. (kg.)			
TITLE SPLINE SHAFT-IV (FEED ASSY.)				DRAWING No. 3-M.04b-10839		REV. 17 01.			
No. of Sheets:				Sheet No.					

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± 30911	-0.010	± 24.57	-0.020	3.2 / 1.6 / 0.8
	-0.040		-0.041	
± 28	-0.025	± 25.0	± 0.015	
	-0.047	± 25.0	± 0.002	

39-609 A



VIEW 'P'

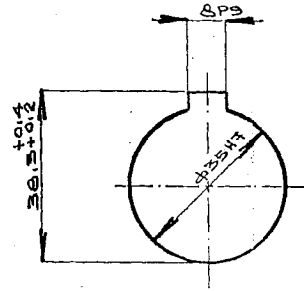
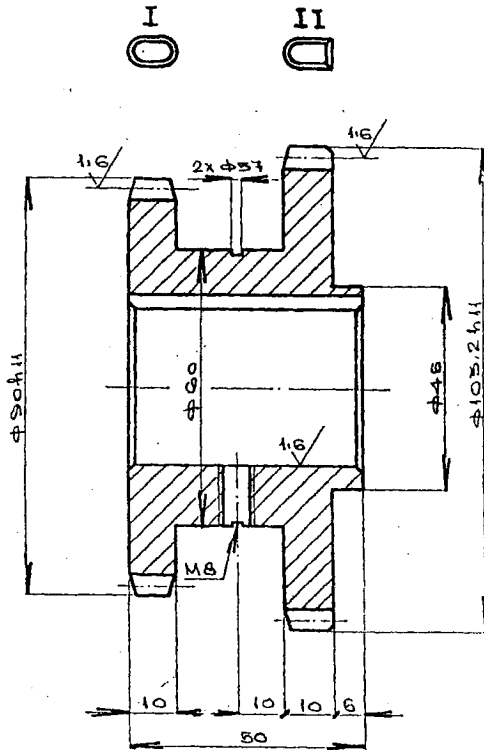
CHAMFER CORNERS FOR 1/45°
HARDENED TO HRC 28±2

REFERENCE ONLY
NOT FOR MANUFACTURE
Sigs: Desy

		55C8-1S:5517-1-38		B-M-04b-2160		01
No. of	DESCRIPTION	MATERIAL	STD/BPS	Net Gross wt. (kg./wt. lbs)	DRAWING No.	Item No.
REFERENCE :	ALTERATIONS		DATE	SIGN.	INDEX	
SCALE	DRAWN	WT ADDED		19.06.13	K.R	01
1:1	CHECKED					
	APPROVED					
	DATE	09051991				
MACHINE : RADIAL DRILLING		TYPE : DRHO		Total wt. (kg.)		
FILE		SPLINE		DRAWING No.		REV.
SHAFT-II		(FEED ASSY.)		17		
3-M.04b.10838		01		No. of Sheets:		Sheet No.

39-609 A

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$\phi 35H7$	+0.025	$\phi 30h11$	-0.000
	+0.000		-0.220
BPS	-0.015	$\phi 103.2h11$	-0.000
	-0.051		-0.220

3/2/16

	I	II
NO. OF TEETH.	43.	50.
MODULE.	2.	2.
PRESSURE ANGLE.	20°	20°
WIDTH ACROSS 6 TEETH.	33.8738	33.60
CORRECTION FACTOR.	0.00	0.2
QUALITY & TOL. ZONE.	SC DIN 3967.	SC DIN 3967.
MATING NO. OF TEETH.	27.	20.
GEAR DRG. NO.	4-M-04b.4565	4-M-04b.4565
CENTRE DISTANCE.	70.	70

HARDENED TO Rc 35 ± 2.
CHAMFER CORNERS FOR 1.6°

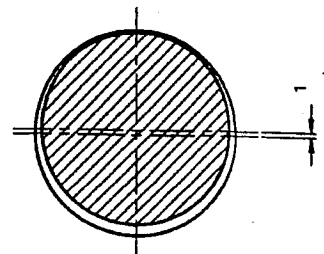
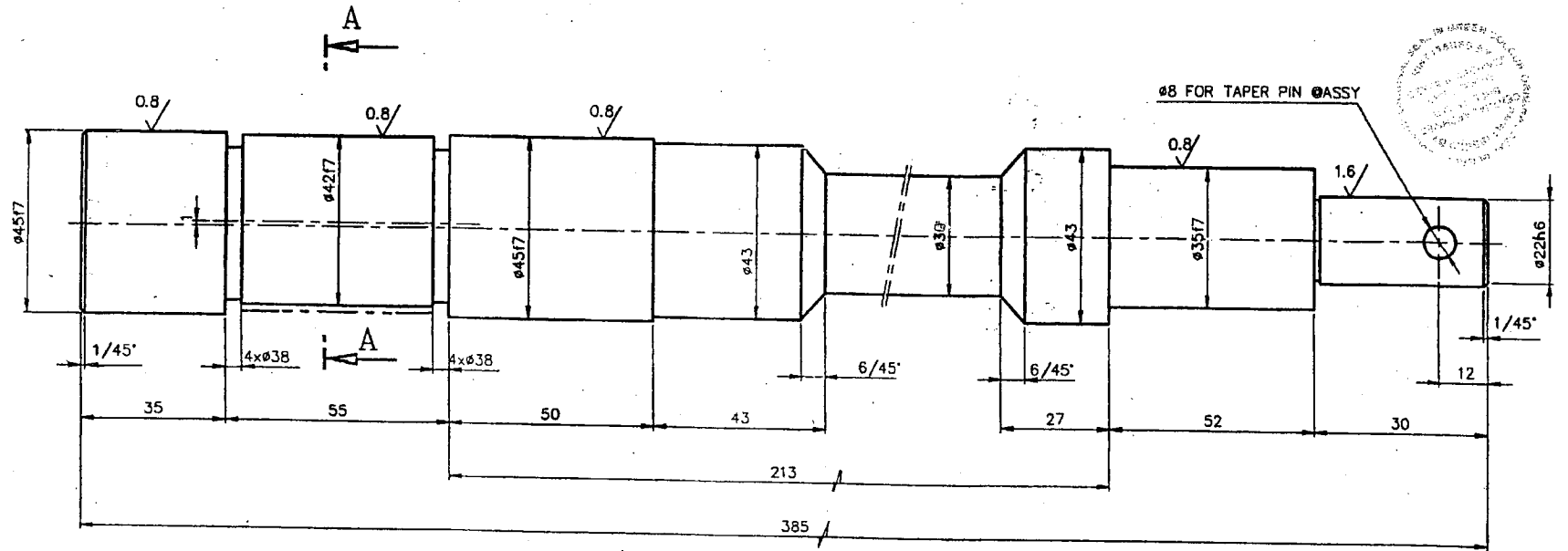
REFERENCE ONLY
NOT FOR MANUFACTURE
Sign: Date:

No. of pcs.	DESCRIPTION	MATERIAL	STD/BPS	Net wt. (kg)	GROSS wt. (kg)	DRAWING No.	Item No.
	55C8	1S:5517	1.43	1.046	2160	06	
REFERENCE:	ALTERATIONS		DATE	SIGN.	INDEX		
SCALE	DRAWN	HARDENED, CORRECTION WERE CHANGED		20.06.12	KE		
1:1	CHECKED						
	APPROVED						
	DATE	27.04.1994					
MACHINE: RADIAL DRILLING		TYPE: DRT-10.		Total wt. (kg.)			
TITLE		DRAWING No.		REV.			
DOUBLE GEAR 50T/103.2		3-M-04b-10837		17		01	
(FEED ASSY. - SHAFT-III)		No. of Sheets:		Sheet No.			

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ALL DIMENSIONS ARE IN MM

ø45f7	-0.025 -0.050	ø35f7	-0.025 -0.050	6.3/1.6/0.8/
ø42f7	-0.025 -0.050	ø22h6	-0.000 -0.013	



SECTION A-A

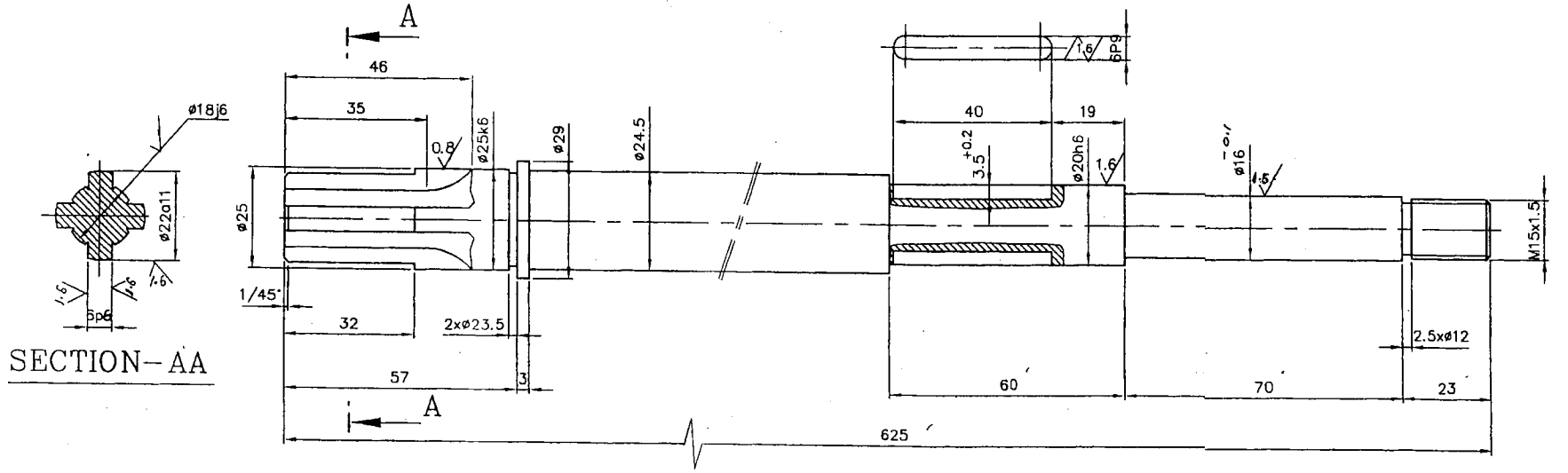
NOTE:-
 ----- CASE HARDEN TO HRC 58^{±2}
 CASE DEPTH 0.4 mm.
 AVOID SHARP CORNERS.

X	ø45 x 385L		13Ni13Cr3	IS:4432	4-80		
	DESCRIPTION		MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
REFERENCE:				COMPONENT CODE: 01	EQUIPMENT CODE: 03		
SCALE: DRAWN		P.A.ROSS		MATL. CHANGED	DCN REF	DATE	SIGN.
CHECKED		<i>[Signature]</i>				02-07-91	CSJ
APPROVED		<i>[Signature]</i>					01
DATE		27-03-95					
MACHINE: RADIAL DRILLING M/C				TYPE: VR8 & VR 104 A			
TITLE: ECCENTRIC SHAFT (ø45-385L)		DRAWING No. 3-M-04B-3783		REV. 01			
(DRILL HEAD LOCKING) 22508 3404 F2				Noof Sheets		Sheet No.	

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 TRICHYRAPPALLY - 620 014.

ALL DIMENSIONS ARE IN MM

ø25k6	+0.015 +0.002	ø20h6	-0.000 -0.010	3.2/1.6/0.8/
ø18j6	+0.008 -0.003	ø22a11	-0.300 -0.430	
6p6	+0.024 +0.015	6P9	-0.012 -0.042	



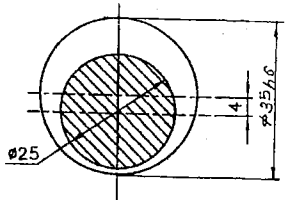
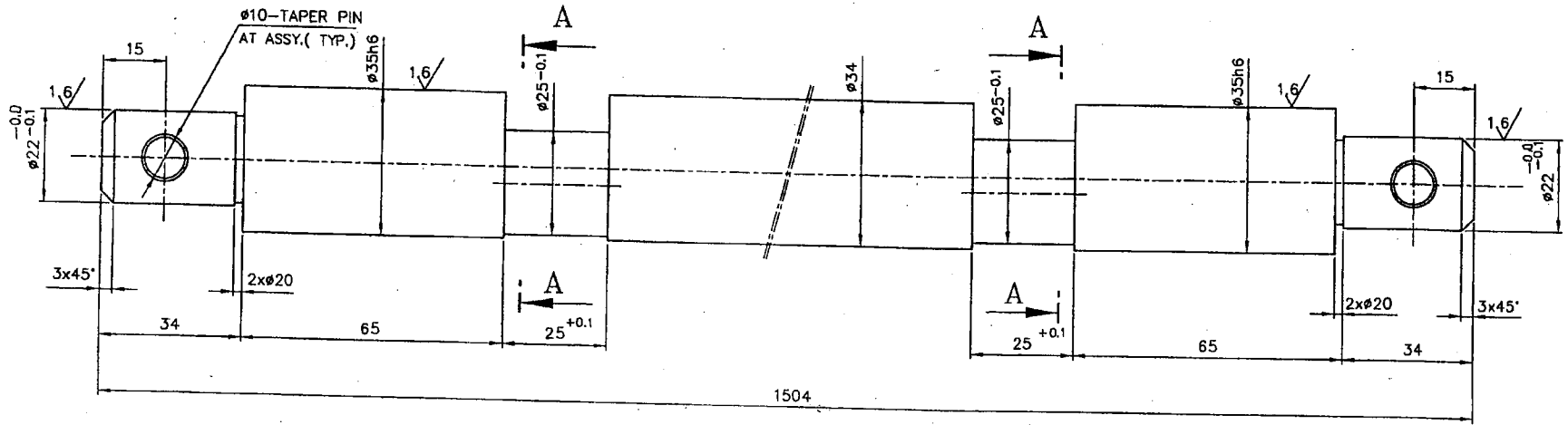
CHAMFER ALL SHARP CORNERS TO 1/45°

φ 26 x 625 L		45CB	IS: 7283	1.98		
Qty	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
REFERENCE:				COMPONENT CODE: 01	EQUIPMENT CODE: 17	
SCALE	DRAWN	P. A. ROSS / <i>[Signature]</i>				
	CHECKED	<i>[Signature]</i>				
1:1	APPROVED	<i>[Signature]</i>				
	DATE	23-07-02				
MACHINE: RADIAL DRILLING			TYPE: DRT 10			
TITLE: SHAFT ø29x625L (DRILLING HEADSTOCK ASSY.)			DRAWING No: 3-M-04B-12168 17		REV.	
			Half Sheets:		Sheet No	

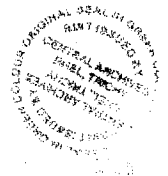
CAUTION: THIS DRAWING IS OUR SOLE PROPERTY AND SHOULD NOT BE USED IN ANY FORM FOR ANY PURPOSE WITHOUT THE WRITTEN PERMISSION OF BAWAT HEAVY ELECTRONICS LIMITED
 TRODURAPPALLI - 680 01A.

ALL DIMENSIONS ARE IN MM

ø35h6	-0.000	3.2/1.6/✓
	-0.016	



SECTION - AA



CHAMFER ALL SHARP CORNERS TO 1/45°

No. of Pieces	ø35x1504	45C8	IS: 7283	10.07		
	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
REFERENCE:				COMPONENT CODE: 01	EQUIPMENT CODE: 17	
SCALE	DRAWN	P. A. ROSS	ALTERATIONS:	DCN REF	DATE	SIGN. INDEX
1:1	CHECKED					
	APPROVED					
	DATE	11-12-02				
	MACHINE: RADIAL DRILLING	TYPE: DRT10				
	TITLE:	ECCENTRIC SHAFT (SADDLE LOCK ASSY.)		DRAWING No:	17	REV.
				3-M-04B-12222		
				No. of Sheets:	Sheet No:	