



# BHARAT HEAVY ELECTRICALS LIMITED

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

PHONE :0431-2577938  
GRAMS : BHARATELEC  
FAX NO: 0431-2520719  
E-mail:  
Web:

Page  
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| Enquiry No                                                                                                                                                                                                                                                                                                                                                                                                     | Enquiry Date | Due Date for Quotation |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------|
| 2661800039 - 55                                                                                                                                                                                                                                                                                                                                                                                                | 01.02.2018   | 24.02.2018             |
| Please quote Enquiry No, Date and due date in all correspondences. This is only a request for quotation and not an order.<br><b>Bid should be submitted in two parts. 1.Techno-commercial bid (Part-I) and 2.Price bid(Part-II) in a separate sealed cover and both covers must be placed in a third cover and sealed. Our Enquiry No., Enq. date &amp; Enq. Due date must be written on all three covers.</b> |              |                        |

| Item | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Unit | Quantity | Delivery Quantity | Schedule Date |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------|-------------------|---------------|
| 10   | <p>PLANETARY GEAR BOX ASSEMBLY</p> <p>Dovetail drive gear box assembly CBH-100</p> <p>The assembly consists of following part as per drawings given below.</p> <p>1.Gear Housing-2M01B2104462</p> <p>2.Housing-3M01B2113785</p> <p>3.Double gear-3M01B2112256</p> <p>4.Intermediate Pinion shaft-3M01B2113555</p> <p>5.Intermediate Pinion shaft-4M01B2127057</p> <p>6.Spur Gear-4M01B2128182</p> <p>7.Spur gear-4M01B2129340</p> <p>NOTE:</p> <p>1.Gear box shall be supplied in assembled condition.</p> <p>2.ONE number of assembled gear box shall be supplied for inspection/acceptance. On acceptance,another gear box shall be supplied.</p> <p>3.All the bearings mentioned in the assembly drawings are scope of the vendor.</p> <p>4. All the spacers and required circlips are scope of the vendor.</p> <p>VENDOR QUALIFYING CRITERIA</p> <p>Only those vendors who satisfy the following conditions will get qualified to participate in the tender:</p> <p>1. Vendor should have minimum 2 years of experience in this field.</p> <p>2. Previous PO details for supplying similar kind of items to BHEL and/or any-other Organisation should be submitted along with offer.</p> <p>Otherwise offer will be rejected.</p> | SET  | 2.000    | 2.00              | 03.03.18      |

## General Note:

GENERAL NOTE:

PLEASE SUBMIT YOUR OFFER IN TWO PART BID SYSTEM

All the tenders may be addressed to the following address:

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

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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2661800039 / 01.02.2018

23505

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

Offers will be accepted only up to 14.00 Hrs on the due date. Therefore, vendors shall ensure to submit the offers well before this time. All due date extension requirements should be addressed to the respective Purchase mail IDs. All the due date extension requests from vendors will be considered only up to 48 hours before the due date and time.

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

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

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

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

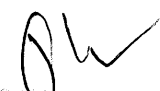
The supplier shall submit EI/EII forms to BHEL time to time as indicated by the BHEL and in case of inordinate delay in issuing EI/EII forms, then BHEL reserves the right to deduct 5% of the value of the supplied items against which EI/EII forms pending to be issued

## Enclosures:

"LD clause has to be confirmed without fail."

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,

**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 <b>quoted item wise</b> 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 <b>Packing &amp; Forwarding</b> charges if any. <b>Applicable % of ED &amp; Sales Tax, Freight &amp; Insurance, Installation &amp; Commissioning Charges should be clearly Indicated</b>                                                                                                                                                                                                                   |                                  |
| <b>Validity of offer</b> 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                                                                                                                                                                                                                                                                                                                                                                                                                       |                                  |
| <b>Liquidated damages @ '0.5% per week</b> subject to a maximum of 10% of the order value shall be applicable for delay in deliveries <b>For Details Refer Annexure- v</b>                                                                                                                                                                                                                                                                                                                                                       |                                  |
| <b>Following Risk Purchase clause</b> shall be applicable<br>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 |                                  |
| <b>Payment term for supply portion:</b><br>Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials<br><b>For details Refer Annexure- v</b>                                                                                                                                                                                                                                                                                                                                        |                                  |
| Erection / commissioning: (if applicable only)<br>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 <b>sealed cover super-scribing clearly the Enquiry reference and due date.</b>                                                                                                                                                                                                                                                                                                                                                                                                                |                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                  |
| GST in %                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                  |
| Packing & Forwarding Charges ( if any in % only)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                  |
| Percentage of Freight& transit insurance charges, if any<br>Freight charges from Dispatching station to BHEL, Tiruchirappalli<br>• 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 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. |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------|-------------|--------------|
|       |                                                                                                                                                                                                               |      |          |             |              |
|       | <b>TOTAL VALUE IN RS.</b>                                                                                                                                                                                     |      |          |             |              |
|       | <b>Packing &amp; Forwarding charges in % if any</b>                                                                                                                                                           |      |          |             |              |
|       | <b>Freight &amp; Insurance Charges In % if freight charges are not mentioned it will be considered as FOR-BHEL TRICHY.</b>                                                                                    |      |          |             |              |
|       | <b>GST (indicate in %)</b>                                                                                                                                                                                    |      |          |             |              |
|       | <b>Approximate Net weight of the total consignment</b>                                                                                                                                                        |      |          |             |              |
|       | <b>Approximate Gross weight of the total consignment</b>                                                                                                                                                      |      |          |             |              |
|       | <b>Approximate Dimensions of the Consignment</b>                                                                                                                                                              |      |          |             |              |
|       | <b>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.</b> |      |          |             |              |

**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.**

| <b>Payment Term (Indigenous)</b>                                                                                                                                                                                                                                                              |                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>If materials are receivable at Stores/Trichy without PBG</b>                                                                                                                                                                                                                               | Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials.                                                   |
| <b>If materials are receivable at Stores/Trichy with PBG</b>                                                                                                                                                                                                                                  | 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.<br>“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.                                                                                                                                                                                         |

| <b>Liquidated Damages / Penalty -</b>                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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).                                |

| <b>Guarantee / Warranty Period – (if applicable)</b>                              |
|-----------------------------------------------------------------------------------|
| Normally No deviation permitted and the deviated offers are liable for rejection. |

| <b>Ranking-</b>                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------|
| BHEL will consider the ranking after the loading is applied as referred above wherever deviations are observed. |

| <b>Performance Bank Guarantee – (if applicable)</b>                               |
|-----------------------------------------------------------------------------------|
| 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 for .....Micro / Small (Strike off which is not applicable)  
Category under MSMED Act 2006.

Date:

(Signature)

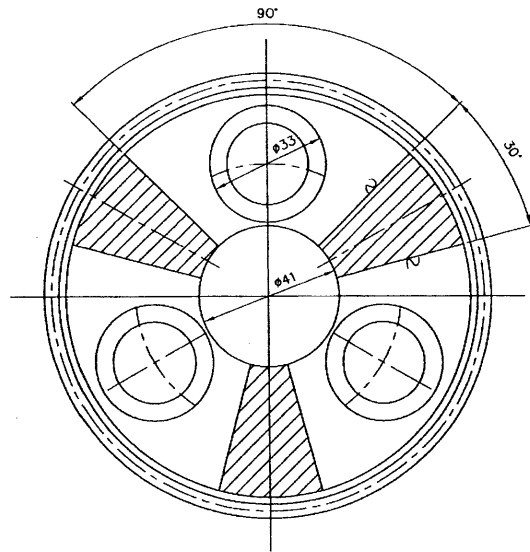
Name -

Membership number -

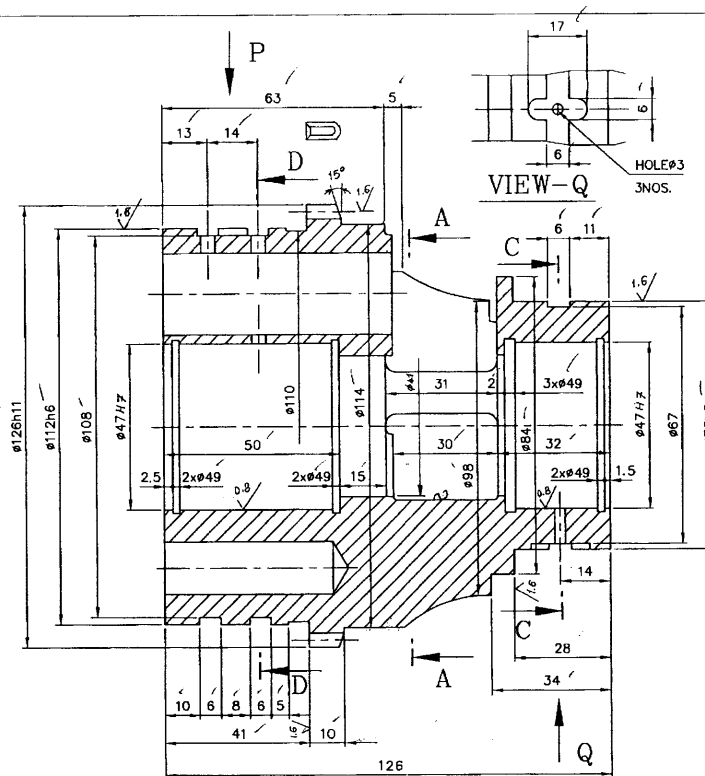
Seal of Chartered Accountant

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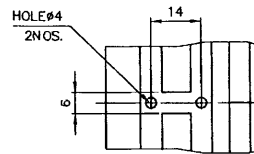
ALL DIMENSIONS ARE IN MM



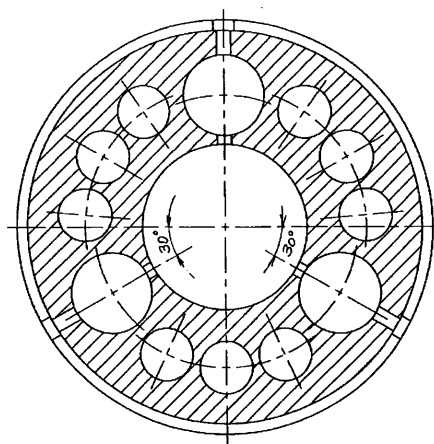
SEC-AA



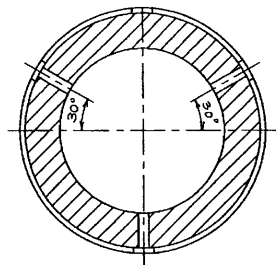
SEC-BB



VIEW-P



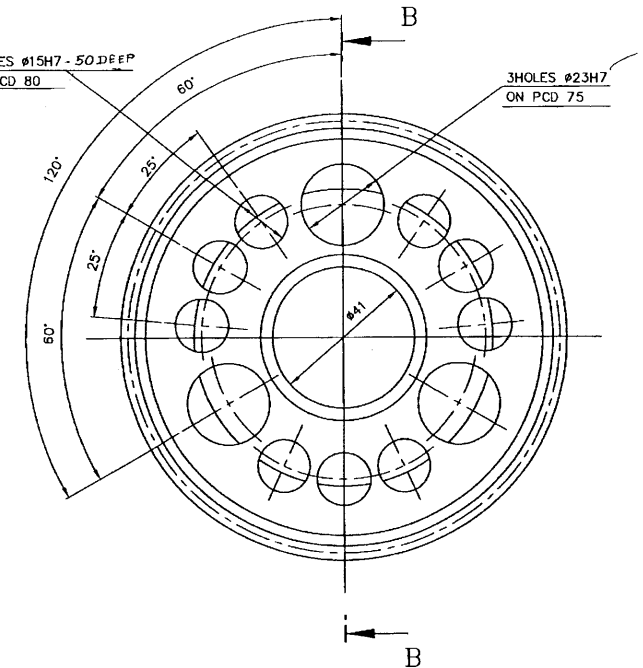
SEC-DD



SEC-CC

|                     |          |                     |          |                    |          |                                        |
|---------------------|----------|---------------------|----------|--------------------|----------|----------------------------------------|
| $\phi 70 \pm 0.00$  | $-0.000$ | $\phi 47 \pm 0.00$  | $+0.025$ | $\phi 15 \pm 0.00$ | $+0.018$ | $3.2 \sqrt{1.6} \sqrt{0.8} \sqrt{0.4}$ |
| $\phi 112 \pm 0.00$ | $-0.000$ | $\phi 126 \pm 0.00$ | $-0.000$ | $\phi 23 \pm 0.00$ | $+0.021$ |                                        |
|                     | $-0.022$ |                     | $-0.250$ |                    | $+0.000$ |                                        |

9 HOLES  $\phi 15 \pm 0.00$  - 50 DEEP  
ON PCD 80



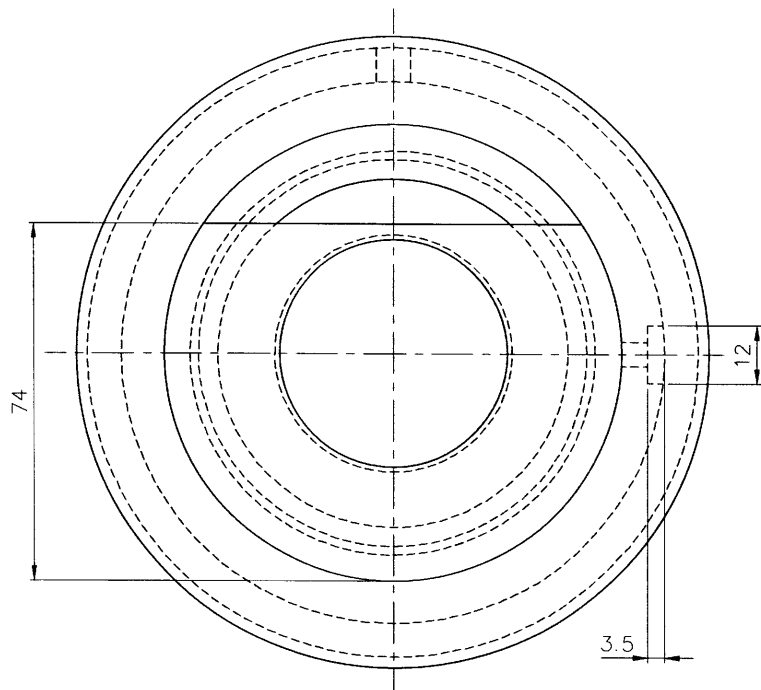
|                          |             |
|--------------------------|-------------|
| NO. OF TEETH             | 54          |
| MODULE                   | 2.25        |
| PRESSURE ANGLE           | 20°         |
| WIDTH ACROSS 7 TEETH     | 44.8765     |
| CORRECTION FACTOR        | NIL         |
| Q.L.T.Y. & TOL. ZONE     | 9c DIN 3967 |
| MATING GEAR NO. OF TEETH | -           |
| MATING GEAR DRAWING NO.  | -           |
| CENTRE DISTANCE          | -           |

|                                                         |                    |                    |                           |             |          |
|---------------------------------------------------------|--------------------|--------------------|---------------------------|-------------|----------|
| P. Cu Sn 7                                              |                    | IS: 28             | 5 - 0                     |             |          |
| DESCRIPTION                                             | MATERIAL           | STANDARD           | NET WT. IN KGS.           | DRAWING No. | ITEM No. |
| REFERENCE                                               | COMPONENT CODE: D8 | EQUIPMENT CODE: 21 | ALTERATIONS:              | DCN REF     | DATE     |
| SCALE                                                   | DRAWN              | G.G.R.             | CHECKED                   | APPROVED    | DATE     |
| 1:1                                                     |                    |                    |                           |             | 17/03/03 |
| MACHINE: HOR. BORING                                    |                    |                    | TYPE: CBH-100             |             |          |
| TITLE: GEAR HOUSING (DOVE TAIL DRIVE) 54T. / $\phi 126$ |                    |                    | DRAWING No. 2-M-01B-04462 |             |          |
| Half Sheets                                             |                    |                    | Sheet No.                 |             |          |



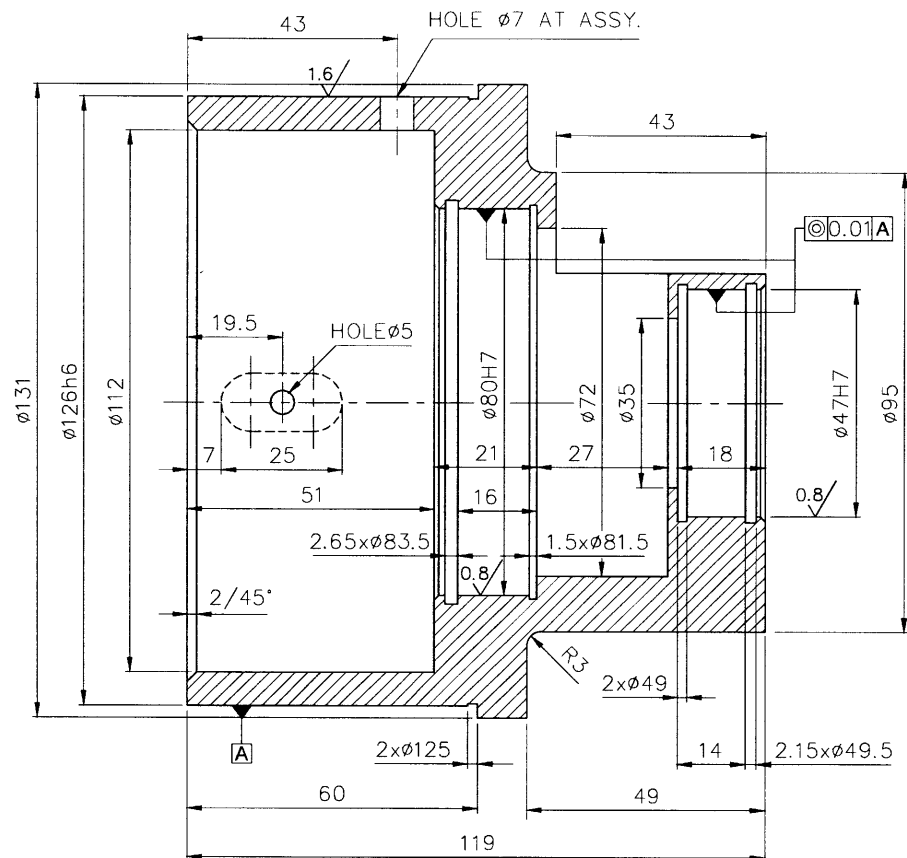
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ALL DIMENSIONS ARE IN MM



NOTE: —

CHAMFER CORNERS FOR 1/45°

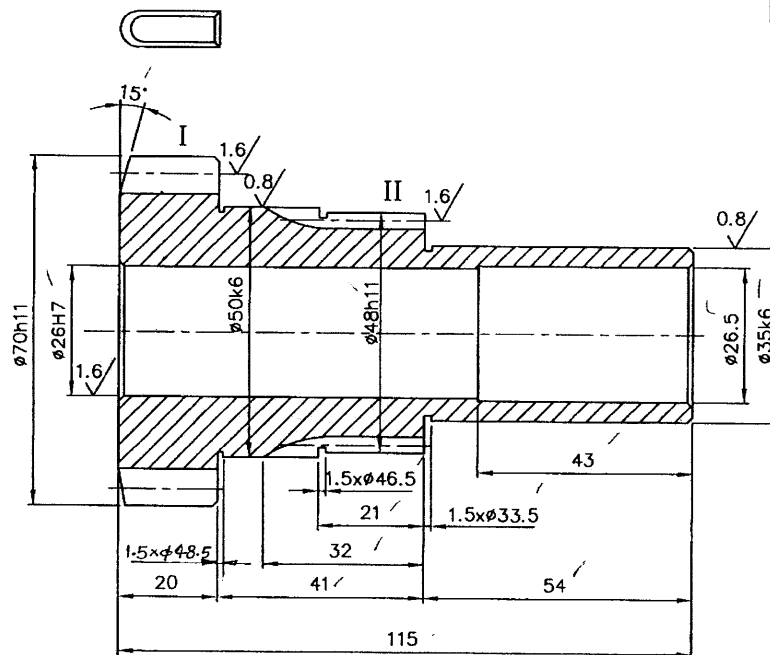


|                                                                                       |                            |                 |          |                |                |             |       |
|---------------------------------------------------------------------------------------|----------------------------|-----------------|----------|----------------|----------------|-------------|-------|
|  | Ø131x119L                  |                 | 45C8     | IS: 7283       | 4.00           |             |       |
|                                                                                       | DESCRIPTION                |                 | MATERIAL | STANDARD       | NET.WT.IN KGS. | DRAWING No. |       |
|  | REFERENCE:                 |                 |          | ALTERATIONS:   | DCN REF        | DATE        | SIGN. |
|  |                            |                 |          |                |                |             |       |
| SCALE:                                                                                | DRAWN                      | S.Selvamanickam |          |                |                |             |       |
|                                                                                       | CHECKED                    |                 |          |                |                |             |       |
|                                                                                       | APPROVED                   |                 |          |                |                |             |       |
|                                                                                       | DATE                       | 19/02/11'       |          |                |                |             |       |
|  | MACHINE: HORIZONTAL BORING |                 |          | TYPE: CBH-100  |                |             |       |
|                                                                                       | TITLE:                     |                 |          | DRAWING No:    |                |             |       |
|                                                                                       | HOUSING<br>(FACE PLATE)    |                 |          | 3M01B2113785   |                |             |       |
| Sheet No:                                                                             |                            |                 |          | No. of Sheets: |                |             |       |

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CAUTION:

ALL DIMENSIONS ARE IN MM



|       |                  |        |                  |              |
|-------|------------------|--------|------------------|--------------|
| ø26H7 | +0.021<br>+0.000 | ø70h11 | -0.000<br>-0.190 | 3.2/1.6/0.8/ |
| ø35k6 | +0.018<br>+0.002 | ø48h11 | -0.000<br>-0.160 |              |
| ø50k6 | +0.018<br>+0.002 |        |                  |              |
|       |                  |        |                  |              |

|                         |                             |
|-------------------------|-----------------------------|
| NO.OF TEETH             | 18                          |
| MODULE                  | 3.5                         |
| PRESSURE ANGLE          | 20°                         |
| WIDTH ACROSS 3 TEETH    | 26.7134<br>-0.141<br>-0.188 |
| CORRECTION FACTOR       | NIL                         |
| QLTY.&TOL.ZONE          | 9c DIN 3967                 |
| MATING GEAR NO.OF TEETH | —                           |
| MATING GEAR DRAWING NO: | —                           |
| CENTRE DISTANCE         | —                           |

|                         |                            |
|-------------------------|----------------------------|
| NO.OF TEETH             | 30                         |
| MODULE                  | 1.5                        |
| PRESSURE ANGLE          | 20°                        |
| WIDTH ACROSS 4 TEETH    | 16.129<br>-0.113<br>-0.150 |
| CORRECTION FACTOR       | NIL                        |
| QLTY.&TOL.ZONE          | 9c DIN 3967                |
| MATING GEAR NO.OF TEETH | 20                         |
| MATING GEAR DRAWING NO: | 4-M-01B-27057              |
| CENTRE DISTANCE         | 37.5                       |

NOTE:--

CHAMFER THE EDGES TO 1/45°  
HARDEN TO HRC40<sup>±2</sup>

|                                  |             |            |                           |                |                    |          |
|----------------------------------|-------------|------------|---------------------------|----------------|--------------------|----------|
| ✓                                | ø70x115L    | 55C8       | IS: 5517                  | 1-16           |                    |          |
| No of Pieces                     | DESCRIPTION | MATERIAL   | STANDARD                  | NET.WT.IN KGS. | DRAWING No.        | ITEM No. |
| REFERENCE:                       |             |            | COMPONENT CODE: 08        |                | EQUIPMENT CODE: 21 |          |
| SCALE                            | DRAWN       |            | ALTERATIONS:              | DCN REF        | DATE               | SIGN.    |
| 1:1                              | CHECKED     |            |                           |                |                    |          |
|                                  | APPROVED    |            |                           |                |                    |          |
|                                  | DATE        | 14-03-2003 |                           |                |                    |          |
| MACHINE: HORIZONTAL BORING       |             |            | TYPE: CBH100              |                |                    |          |
| TITLE: DOUBLE GEAR               |             |            | DRAWING No: 3-M-01B-12256 |                | REV.               |          |
| (DOVETAIL DRIVE) 18Txø70/30Txø48 |             |            | No of Sheets:             |                | Sheet No:          |          |

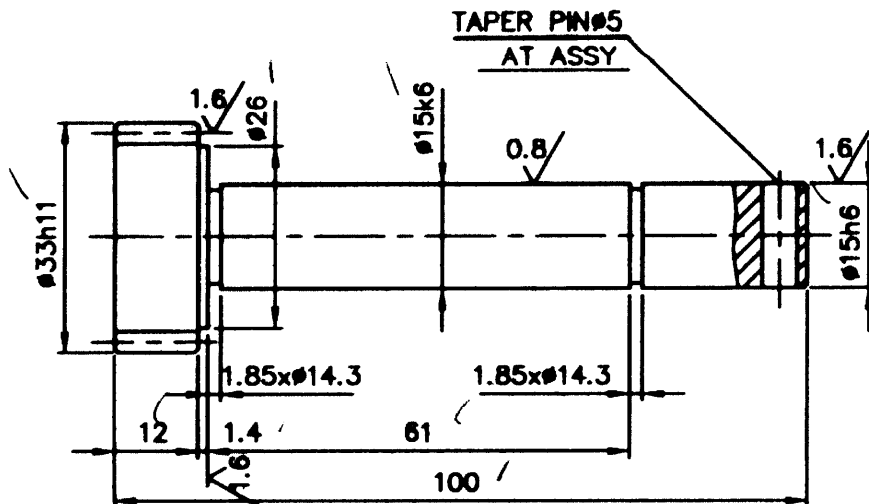


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THERUGUPALLI - 600 064.

ALL DIMENSIONS ARE IN MM

|       |        |        |        |
|-------|--------|--------|--------|
| Ø15k6 | +0.012 | Ø33h11 | -0.000 |
|       | +0.000 |        | -0.160 |
|       |        | Ø15h6  | -0.000 |
|       |        |        | -0.011 |

3.2//1.6/0.8/



|                          |               |
|--------------------------|---------------|
| NO. OF TEETH             | 20            |
| MODULE                   | 1.5           |
| PRESSURE ANGLE           | 20°           |
| WIDTH ACROSS 3 TEETH     | 11.49         |
| CORRECTION FACTOR        | NIL           |
| Q.LTY. & TOL. ZONE       | 9c DIN 3967   |
| MATING GEAR NO. OF TEETH | 30            |
| MATING GEAR DRAWING NO.  | 3-M-01B-12256 |
| CENTRE DISTANCE          | 37.5          |

NOTE: -

CHAMFER THE EDGES TO 0.5/45°

HARDEN TO HRC40<sup>±2</sup>

|                                                            |          |                           |                    |             |          |
|------------------------------------------------------------|----------|---------------------------|--------------------|-------------|----------|
| Ø33x100L                                                   | 55C8     | IS: 5517                  | 0.21               |             |          |
| DESCRIPTION                                                | MATERIAL | STANDARD                  | NET.VT.IN KGS.     | DRAWING No. | ITEM No. |
| REFERENCE:                                                 |          | COMPONENT CODE: 08        | EQUIPMENT CODE: 21 |             |          |
| SCALE                                                      | DRAWN    | CHECKED                   | APPROVED           | DATE        | SIGN.    |
| 1:1                                                        |          |                           |                    | 14-03-2003  |          |
| MACHINE: HORIZONTAL BORING                                 |          | TYPE: CBH100              |                    |             |          |
| TITLE: PINION SHAFT <sub>20TxØ33</sub><br>(DOVETAIL DRIVE) |          | DRAWING No: 4-M-01B-27057 |                    | REV.        |          |
| No. of Sheets                                              |          | Sheet No                  |                    |             |          |

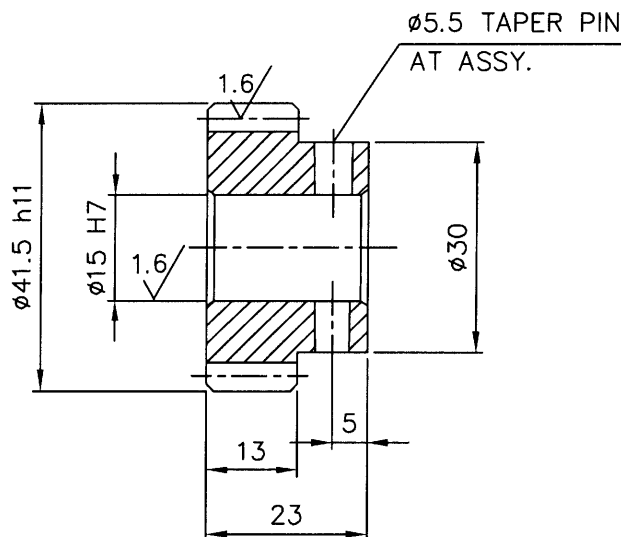


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ALL DIMENSIONS ARE IN

|           |        |
|-----------|--------|
| ø15 H7    | +0.025 |
|           | +0.000 |
| ø41.5 h11 | -0.000 |
|           | -0.160 |

3.2/1.6



|                         |                           |
|-------------------------|---------------------------|
| NO.OF TEETH             | 25                        |
| MODULE                  | 1.5                       |
| PRESSURE ANGLE          | 20°                       |
| WIDTH A/C 4 TEETH       | 16.02<br>-0.113<br>-0.150 |
| QUAL.& TOL ZONE         | 9C DIN 3967               |
| CORRECTION FACTOR       | NIL                       |
| MATING GEAR NO.OF TEETH | 25                        |
| MATING DRAWING NO:      | 3M01B21-13555             |
| CENTRE DISTANCE         | 37.5                      |

NOTE:-

1.CHAMFER ALL SHARP CORNERS TO 1/45°

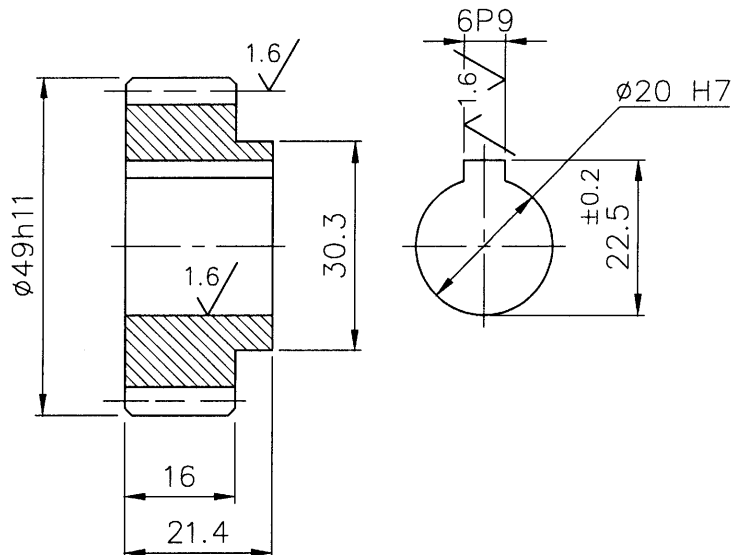
|               |             |                               |  |          |               |                |                |          |
|---------------|-------------|-------------------------------|--|----------|---------------|----------------|----------------|----------|
|               |             | RODø41.5x32 L                 |  | 45 C8    | IS: 7283      | 0.21           |                |          |
| No. of Pieces | DESCRIPTION |                               |  | MATERIAL | STANDARD      | NET.WT.IN KGS. | DRAWING No.    | ITEM No. |
|               | REFERENCE:  |                               |  |          | ALTERATIONS:  | DCN REF        | DATE           | SIGN.    |
| SCALE         | DRAWN       | P.A.ROSS                      |  |          |               |                |                |          |
| 1:1           | CHECKED     |                               |  |          |               |                |                |          |
|               | APPROVED    |                               |  |          |               |                |                |          |
|               | DATE        | 29-04-08                      |  |          |               |                |                |          |
|               |             | MACHINE: HORIZONTAL BORING    |  |          | TYPE: CBH 100 |                |                |          |
|               |             | TITLE: SPUR GEAR              |  |          | DRAWING No:   |                |                |          |
|               |             | 25T/ø41.5<br>(DEVETAIL ASSY.) |  |          | 4M01B2128182  |                |                |          |
|               |             |                               |  |          | Sheet No:     |                | No. of Sheets: |          |

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ALL DIMENSIONS ARE IN MM

|        |        |     |        |
|--------|--------|-----|--------|
| ø49h11 | -0.000 | 6P9 | -0.012 |
|        | -0.160 |     | -0.042 |
| ø20H7  | +0.021 |     |        |
|        | 0.000  |     |        |

3.2//1.6/



NOTE: -

SHARP CORNERS TO BE REMOVED  
HARDENED TO HRc.35<sup>±2</sup>

|                         |                                   |
|-------------------------|-----------------------------------|
| NO.OF TEETH             | 18                                |
| MODULE                  | 2.5                               |
| PRESSURE ANGLE          | 20°                               |
| WITH ACROSS 3 TEETH     | 18.74 <sup>-0.127</sup><br>-0.169 |
| CORRECTION FACTOR       | -0.2                              |
| QLTY.&TOL.ZONE          | 9C DIN 3967                       |
| MATING GEAR NO.OF TEETH | -                                 |
| MATING GEAR DRAWING NO: | -                                 |
| CENTRE DISTANCE         | -                                 |

|                                                   |             |                 |  |          |                          |                |             |       |          |
|---------------------------------------------------|-------------|-----------------|--|----------|--------------------------|----------------|-------------|-------|----------|
| X                                                 |             | ø49x21.4t       |  | 55C8     | IS: 5517                 | 0.25           |             |       |          |
| No. of Pieces                                     | DESCRIPTION |                 |  | MATERIAL | STANDARD                 | NET.WT.IN KGS. | DRAWING No. |       | ITEM No. |
| REFERENCE:                                        |             |                 |  |          | ALTERATIONS:             | DCN REF        | DATE        | SIGN. | INDEX    |
| SCALE                                             | DRAWN       | S.Selvamanickam |  |          |                          |                |             |       |          |
| 1:1                                               | CHECKED     | R.Ramamoorthy   |  |          |                          |                |             |       |          |
|                                                   | APPROVED    | C.S.Jayasheelan |  |          |                          |                |             |       |          |
|                                                   | DATE        | 05.06.12'       |  |          |                          |                |             |       |          |
| MACHINE: HORIZONTAL BORING                        |             |                 |  |          | TYPE: CBH-100            |                |             |       |          |
| TITLE: SPUR GEAR 18TXø49<br>(DOVE TAIL BOX ASSY.) |             |                 |  |          | DRAWING No: 4M01B2129340 |                |             |       |          |
|                                                   |             |                 |  |          | REV.                     |                |             |       |          |
|                                                   |             |                 |  |          | Sheet No: No. of Sheets: |                |             |       |          |