

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

ON 'SRD' FO 'HS'

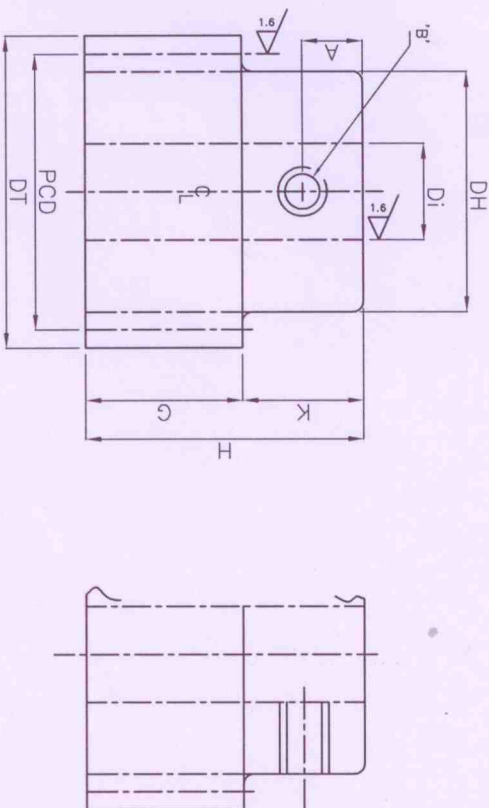
3.2 / 1.6

GEAR DESIGN DATA

| Sl.No. | DESCRIPTION                                    | VAR NO VALUE                 |
|--------|------------------------------------------------|------------------------------|
| 1      | PRESSURE ANGLE                                 | $\alpha=20^\circ$            |
| 2      | NO. OF TEETH                                   | 24                           |
| 3      | NORMAL MODULE                                  | 2.5                          |
| 4      | PITCH CIRCLE DIA. (PCD)                        | 60 MM                        |
| 5      | MEASUREMENT ACROSS 3 TEET (FOR CLASS BC GEARS) | 19.29 $^{+0.07}_{-0.14}$ MM  |
| 6      | PERMISSIBLE RUN OUT ON PCD                     | 50 $\mu$ m                   |
| 7      | PERMISSIBLE ERROR IN FLANK SHAPE               | 16 $\mu$ m                   |
| 8      | PERMISSIBLE ERROR ON PITCH                     | 16 $\mu$ m                   |
| 9      | TIP CIRCLE DIA. (DT)                           | 65hg                         |
| 10     | HOLE DIA (Di)                                  | 19.04 $^{+0.00}_{-0.015}$ MM |
| 11     | HUB DIA (DH)                                   | 50 MM                        |
| 12     | HUB PROJECTION (K)                             | 15 MM                        |
| 13     | GEAR WIDTH (G)                                 | 25 MM                        |
| 14     | DIMN "A"                                       | 8 MM                         |
| 15     | THREAD "B"                                     | M 8                          |
| 16     | WEIGHT                                         | 1 Kg                         |
| 17     | GEAR HEIGHT (H)                                | 40 MM                        |

NOTES:

- DIMENSIONS SHOWN ARE TENTATIVE, SUBJECTED TO MINOR CHANGES WHICH WILL NOT HAVE COST IMPLICATIONS.
- WHERE EVER TOLERANCE IS NOT SPECIFIED, GENERAL TOLERANCES IS TO BE CONSIDERED AS  $\pm 0.1$ MM.
- GEARS TO BE CADMIUM PLATED EXPECT BORE AND TAPED HOLE.
- MATERIAL: IS: 2004 CLASS 4(C-45), HARDEN AND TEMPER TO 200 TO 235 BHN.
- TOTAL NO. OF PINION GEARS : 28
- IN CASE OF ANY DOUBT, DON'T ASSUME. PLEASE ASK.



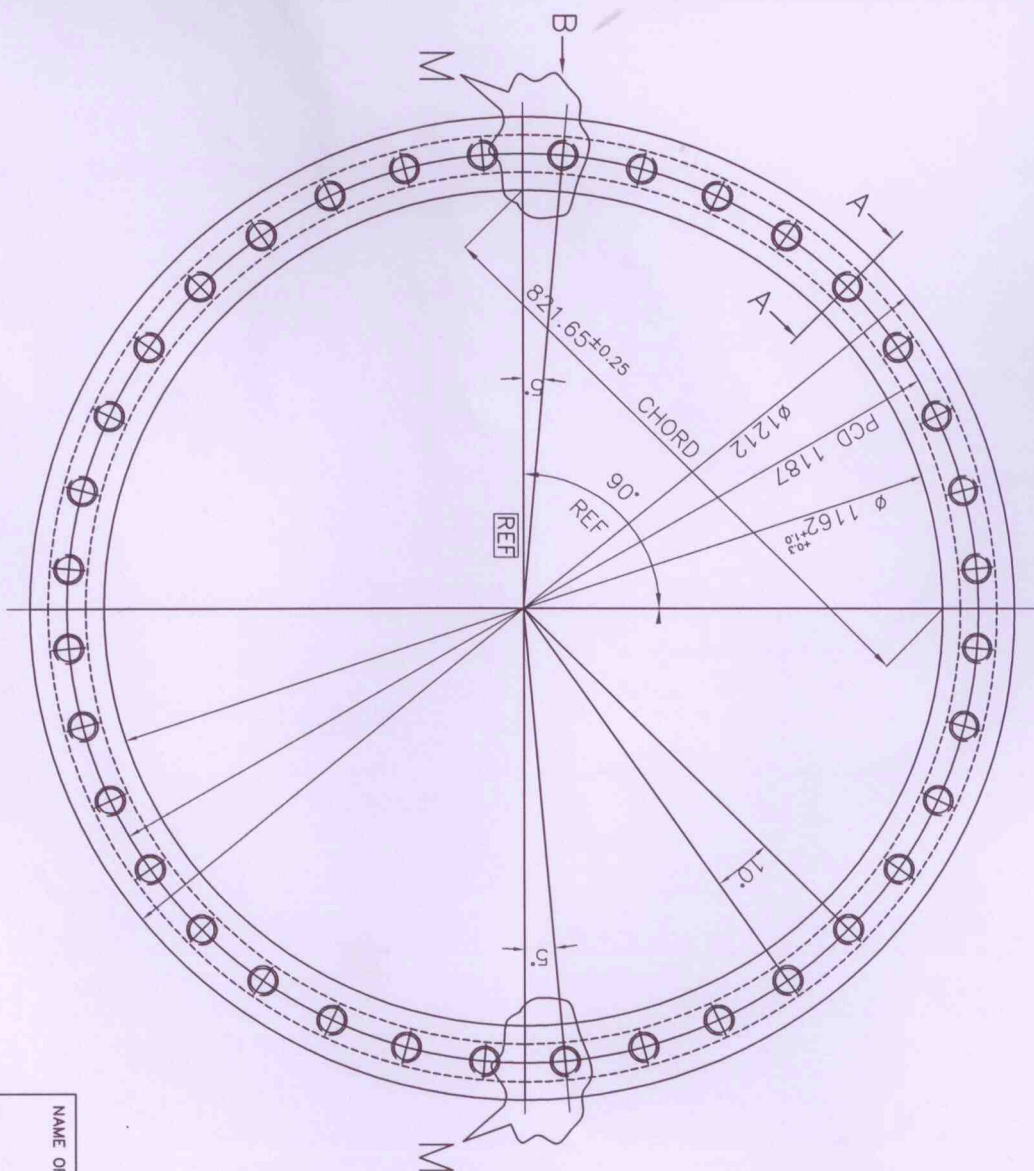
TENTATIVE DRAWING

NAME OF PROJECT

IGV SYSTEM OF AXIAL COMPRESSOR

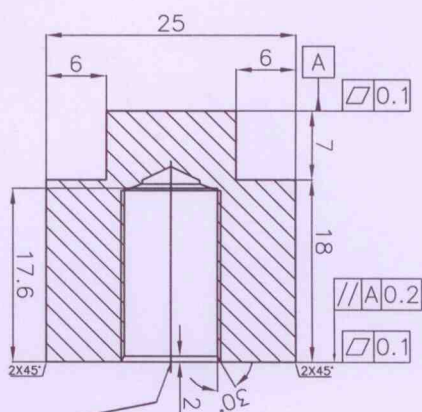
|                                        |                              |                               |                               |
|----------------------------------------|------------------------------|-------------------------------|-------------------------------|
|                                        |                              | BHARAT HEAVY ELECTRICALS LTD. |                               |
| CORP. R&D DIVISION                     |                              | HYDERABAD-500 093             |                               |
| DEPT. TML                              | UNTOC. DIMS. $\phi$ / mm / F | SCALE NTS                     | WEIGHT (KG)                   |
| CODE 50                                |                              |                               |                               |
| TITLE<br>PINION GEAR FOR IGV MECHANISM |                              | CARD CODE N.A.                | DRAWING NO. RD DG 3 50 17 051 |
| NAME VINAY KUMAR                       |                              | SIGN.                         | DATE 20.02.17                 |
| CHD. ARINDAM BERA                      |                              | SIGN.                         | DATE 22.02.17                 |
| APPD. P. GOWRISHANKAR                  |                              | SIGN.                         | DATE 24.02.17                 |
| REF. TO ASSY. DRG.                     |                              | ITEM NO.                      | NO. OF ITEMS                  |
| -N.A.-                                 |                              | -N.A.-                        | 28                            |

SH. OF



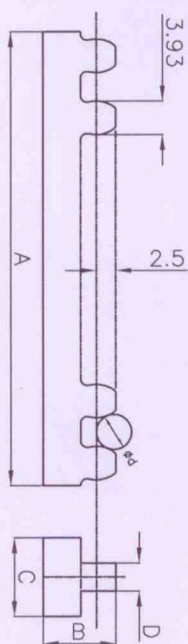
FULL TOOTH  
(TOP BOTH ENDS)  
VIEW-B

TEETH PROFILE



M10, 36 HOLES EQ.SP. TO  
DEPTH 17.6MM WITH IN.   
DO NOT BREAKTHROUGH.

SECTION--A--A



TENTATIVE DRAWING

NAME OF PROJECT

IGV SYSTEM OF AXIAL COMPRESSOR

## HORIZONTAL SPLIT

[illegible]

|                                |  |              |  |                                                                                     |                    |             |                   |              |          |  |
|--------------------------------|--|--------------|--|-------------------------------------------------------------------------------------|--------------------|-------------|-------------------|--------------|----------|--|
| NAME OF PROJECT                |  |              |  |                                                                                     |                    |             |                   |              |          |  |
| IGV SYSTEM OF AXIAL COMPRESSOR |  |              |  |                                                                                     |                    |             |                   |              |          |  |
| BHARAT HEAVY ELECTRICALS LTD.  |  |              |  |                                                                                     | NAME               |             | SIGN.             |              | DATE     |  |
| CORP. R&D DIVISION             |  |              |  |                                                                                     | DRN.               |             | VINAY KUMAR       |              | 27.07.17 |  |
| HYDERABAD-500 093              |  |              |  |                                                                                     | CHD.               |             | ARINDAM BERA      |              | 28.07.17 |  |
|                                |  |              |  |                                                                                     | APPD.              |             | P GOWRISHANKAR    |              | 31.07.17 |  |
|                                |  |              |  |                                                                                     | REF. TO ASSY. DRG. |             |                   |              | ITEM NO. |  |
|                                |  |              |  |                                                                                     | -N.A.-             |             |                   |              | -N.A.-   |  |
|                                |  |              |  |                                                                                     | DRAWING NO.        |             | RD DG 3 50 17 052 |              | REV.     |  |
|                                |  |              |  |                                                                                     | SHI. No. 1         |             | NO. OF SHI. 2     |              | 3        |  |
| DEPT.                          |  | UNTOL. DIMS. |  | SCALE                                                                               |                    | WEIGHT (KG) |                   | NO. OF ITEMS |          |  |
| TML                            |  | OR<br>C/M/F  |  |  |                    | NTS         |                   |              |          |  |
| CODE 50                        |  |              |  |                                                                                     |                    |             |                   |              |          |  |
| TITLE                          |  |              |  |                                                                                     | CARD CODE          |             | DRAWING NO.       |              | REV.     |  |
| RACK GEAR FOR IGV MECHANISM    |  |              |  |                                                                                     | N.A.               |             | RD DG 3 50 17 052 |              | 3        |  |

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

ON 'DRG' FO 'HS'

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

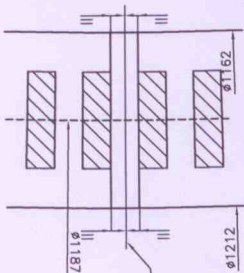
COMPUTER FILE NAME

REF. DRG. NO.

SIGN. AND DATE

INVENTORY NO

| RACK DESIGN DATA (TENTATIVE) |                               |              |
|------------------------------|-------------------------------|--------------|
| Sl.No.                       | DESCRIPTION                   | VAR NO VALUE |
| 1                            | TYPE OF GEAR                  | RACK SPUR    |
| 2                            | PRESSURE ANGLE                | 20°          |
| 3                            | NORMAL MODULE                 | 2.5          |
| 4                            | ADDENDUM                      | 2.5 mm       |
| 5                            | BOTTOM CLEARANCE              | 0.625 mm     |
| 6                            | TOOTH DEPTH                   | 5.625 mm     |
| 7                            | NO.OF TEETH ON MATING GEAR    | 24           |
| 8                            | LENGTH PER PIECE 'A'          | 1861.39 mm   |
| 9                            | TOTAL NO. OF TEETH            | 474          |
| 10                           | DIMN 'C'                      | 25 mm        |
| 11                           | DIMN 'B'                      | 25h9         |
| 12                           | DIMN 'D'                      | 13 mm        |
| 13                           | TOOTH WIDTH AT A DEPTH OF 2.5 | 3.93 mm      |



PARTING PLANE OF HORIZONTAL SPLIT MUST BE EXACTLY IN BETWEEN TWO TEETH.

DETAIL "M"

| REV  | DATE | ALTERED  | REV  | DATE | ALTERED  | REV  | DATE | ALTERED  |
|------|------|----------|------|------|----------|------|------|----------|
| ZONE |      | CHD/APPD | ZONE |      | CHD/APPD | ZONE |      | CHD/APPD |

NOTES:

- 1.DIMENSIONS SHOWN ARE TENTATIVE. SUBJECTED TO MINOR CHANGES WHICH WILL NOT HAVE COST IMPLICATIONS.
- 2.DP TEST ON RACK TEETH AFTER BENDING. NO CRACKS ALLOWED.
- 3.RACK TEETH TO BE CHECKED UP FOR SMOOTH ROLLING OF CORRESPONDING GEAR (DRG.NO. RD DG 3 TM 17 051).
4. AFTER BENDING. LOCAL CORRECTION MAY BE DONE ON RACK TEETH IF REQUIRED.
- 5.RACK TEETH TO BE CADMIUM PLATED
- 6.MATERIAL: IS: 2004 CLASS 4 (C-45); NORMALISED MIN HARD 175 BHN
- 7.WHERE EVER TOLERANCE IS NOT SPECIFIED, GENERAL TOLERANCES IS TO BE CONSIDERED AS  $\pm 0.1\text{MM}$ .
- 8.FULL 360 DEG. RACK GEAR IS TO BE MADE IN 2 HALVES WITH HORIZONTAL SPLIT IN BETWEEN TEETH

NAME OF PROJECT

IGV SYSTEM OF AXIAL COMPRESSOR

|                               |  |  |  |             |  |                   |  |               |  |                    |  |
|-------------------------------|--|--|--|-------------|--|-------------------|--|---------------|--|--------------------|--|
| BHARAT HEAVY ELECTRICALS LTD. |  |  |  | NAME        |  | SIGN.             |  | DATE          |  | NO.OF VAR.         |  |
| CORP. R&D DIVISION            |  |  |  | DRN.        |  | VNAVY KUMAR       |  | 27.07.17      |  | 2                  |  |
| HYDERABAD-500 093             |  |  |  | CHD.        |  | ARINDAM BERA      |  | 28.07.17      |  | 1                  |  |
|                               |  |  |  | APPD.       |  | P.GOWRISHANKAR    |  | 31.07.17      |  | 1                  |  |
| DEPT. TML                     |  |  |  | UNTO. DIMS. |  | SCALE             |  | WEIGHT (KG)   |  | REF. TO ASSY. DRG. |  |
| CODE 50                       |  |  |  | -6744/-     |  | NTS               |  | -N.A.-        |  | -N.A.-             |  |
| TITLE                         |  |  |  | DRAWING NO. |  | RD DG 3 50 17 052 |  | REV.          |  | 3                  |  |
| RACK GEAR FOR IGV MECHANISM   |  |  |  | N.A.        |  | SHT. No 2         |  | NO. OF SHT. 2 |  |                    |  |