

SPECIFIC COMMERCIAL TERMS AND CONDITIONS

For Enquiry No: B508IT8P2180DK1..For Supply of Outer Casings.

This is a mandatory document to be filled and attached to your technical bid for evaluation
(Otherwise your bid will be disqualified)

Sl. No.	Terms & Conditions	Supplier confirmation	Deviations / Remarks
1.	Two Part Bid shall consist of: • <u>Techno commercial Bid</u>, with all technical specification & scope and all applicable Commercial Terms and Conditions including applicable duties/taxes/other charges, except the price, AND • <u>Price Bid</u>, containing ONLY the price and duties/taxes/other charges applicable and should not contain any technical and commercial terms and conditions. a) Technical bid and price bid should be submitted in separate sealed covers – putting them in third cover. b) The details like Tender No, Due Date, Technical Bid or Price Bid, as the case may be, shall be clearly super-scribed on each cover. The third cover containing both technical and price bid covers should be super-scribed with Tender No and Due date. c) Techno-commercial Bid will be opened first and after freezing technical and commercial conditions only, the Price Bid will be opened. d) The date for the Price Bid opening shall be intimated to all the Techno-commercially qualified bidders before the Price Bid is opened. e) The bidder (s) will also be informed, if their Tehno-commercial bid is not acceptable f) The bidders will be allowed to submit the impact due to changes in technical scope /commercial terms or revised price bid, if felt needed, only when their technical/commercial parameters or specifications are changed subsequently. g) Revised offers will not be accepted unless asked for.		
2.	Offer validity should be 90 days minimum from date of price bid opening.		
3.	Quoted PRICES, after Placement of P.O, shall be FIRM and valid till complete execution of the Order without any escalation/increase for any reason whatsoever.		
4.	Payment Terms: • <u>For Indian vendors</u>: 100% payment within 90 days (45 days incase of SSI Units) from the date of dispatch of materials. • <u>For Foreign vendors</u>: 100% payment against irrevocable LC (LC will be opened 30 days prior to dispatch schedule).		
5.	Terms of Delivery: The items are to be quoted on EX-WORKS for Indian vendors and FOB Nearest Port for Foreign vendors. Delivery Period: _____ weeks/months from the date of LOI/PO Delivery shall be strictly quoted w.r.t. the date of LOI/PO only.		

6.	Third Party Inspection: (Mandatory) Inspection by M/s. LLOYDS (nominated inspection agency by BHEL). Charges for inspection are to be included in the price quoted by vendor.		
7.	Guarantee: Materials should be guaranteed for a period of 18 months from date of supply or 12 months from the date of assembly, whichever is later.		
8.	Penalty: a) Penalty (Not Liquidated Damages) will be levied @ 0.5% per week of delayed supply (w.r.t Delivery clause) not exceeding 10% of Total Order value b) No grace period allowed for calculating penalty period. c) Delivery for penalty purpose is w.r.t LR date/Excise invoice date/ Third party inspection clearance certificate date (LLOYDs) For any deviations to the penalty clause, the offer may be rejected or suitably loaded for L1 evaluation.		
9.	a) Price Bids Shall be evaluated on landed cost basis i.e., TOTAL COST TO BHEL (after considering CENVAT or VAT benefit, if any) and w.r.t the finalised Technical Scope and Commercial conditions only. b) In case BHEL decides to load the vendor/vendors on any deviations on Commercial condition(s) whatsoever, it shall in advance intimate such criteria for loading to the concerned vendors before price bid opening c) In case of Multiple items, BHEL has the right to evaluate and arrive at the lowest bidder on Individual item / Total basis at its discretion, and in the interests of BHEL.		
10.	BHEL reserves the right to increase / decrease the quantity indicated in the enquiry.		
11..	Supply should strictly confirm to BHEL drawings / specifications. All tests should be carried out as per BHEL drawings / specifications. All Test certificates, guarantee certificates and Pre inspection reports (PIR) should be furnished along with dispatch documents		
12.	BHEL may choose for placing repeat order for additional quantity, as and when required, with the acceptance of vendor.		
13.	BHEL reserves all rights for rejecting any or all offers without assigning any reason therefor in the interests of BHEL.		
14.	Vendors shall submit offers within the due date. If, no communication is received from any vendor within the due date, it will be deemed that the vendor can not meet our delivery / technical requirements.		
15.	Tender due date: 31.01.2009, 11.00 Hrs. (IST) No tender due date extension		

NOTE TO VENDORS:

a) Vendors to indicate their response to each of the above clauses either by 'YES' or "NO' in the Supplier confirmation column.

b) Vendors , if taking deviations from the specified conditions , may indicate the same clearly in deviation column and if needed on a separate sheet, with reasons for such deviation and in such a case BHEL reserves the right to reject the offer summarily or load the vendor suitably – solely at its discretion and in its interests.

c) Commercial Conditions quoted in any place other than this format , including stated in Vendor's General Terms and conditions enclosed, if any , shall be summarily ignored and be invalid for evaluation of the Preferred Bidder.

d) Vendors to note that the above are specific Terms & conditions only , and in respect of other terms and conditions, BHEL's General Terms & conditions will apply and the same can be obtained upon making a request.

Signature of the supplier



**PLANT PURCHASING
SPECIFICATION
HYDERABAD**

HY19572

REV. NO. 06

PAGE 1 OF 3

**ALLOY STEEL CASTINGS FOR STEAM TURBINES
FOR HIGH TEMPERATURE SERVICE**

**GRADE : G 17 Cr Mo 55
(Material 1.7357)**

1.0 GENERAL:

This specification governs the quality requirements of castings required to operate at high pressure and elevated temperatures in steam turbines.

2.0 APPLICABLE ADDITIONAL SPECIFICATION:

General requirements of steel castings shall be as per plant standard HY0851165 Rev.01 (Based on TLV 0100).

3.0 CHEMICAL COMPOSITION:

The heat analysis according to EN10213 in weight %.

Element	Melt analysis	
	Minimum	Maximum
C	0.15	0.20
Si	-	0.60
Mn	0.50	1.00
S	-	0.020
P	-	0.020
Mo	0.45	0.65
Cr	1.00	1.50
Ni	-	0.50
V	-	0.05
Cu	-	0.30
Al	-	0.04
Ti	-	0.025
Sn	-	0.025

Revisions:

Revised the cross referred standard in cl. 2

Issued :

STANDARDS ENGINEERING DEPARTMENT

Rev. No. 06

Amd.No.

Reaffirmed:

Prepared:

Approved:

Dt .of 1st issue

Dt. MAY, 07

Dt.

Year:

MATLS. ENGG.

GM (ENGG.)

AUG. 1983

HY19572	PLANT PURCHASING SPECIFICATION HYDERABAD	
REV. NO. 06		
PAGE 2 OF 3		

4.0 WELDING:

The welding filler material shall be in according to the WPR and with following analysis (%).

C	Si	Mn	Cr	Mo
0.06 – 0.10	≤ 0.50	≤ 1.20	1.00 – 1.50	0.45 – 0.70

The use of any other welding filler material is allowed only after written permission from BHEL, Hyderabad.

Weld hardness shall be checked at random and documented accordingly. Values of maximum 320 HV or 304 BHN max. are allowed.

5.0 HEAT TREATMENT:

Heat treatment as per EN 10213.

Hardening at 920 - 960°C, holding time according to the wall thickness.

Tempering at 680 - 730°C, holding time according to the wall thickness.

With respect to optimum long-term properties, a microstructure transformation in the upper bainite range is to aimed.

If the supplier carried out rough machining, the casting has to be stress relieved before delivery. The stress relieving temperature is not allowed to raise above the tempering temperature of the casting. The cooling rate for stress relieving should be ≤ 30°C/hr down to 300°C. The stress relieving after rough machining can be dropped, if quenching and tempering after rough machining or production weldings followed by stress relieving will be carried out.

6.0 MECHANICAL PROPERTIES:

The mechanical properties of each casting shall be determined in the delivery condition. The following properties shall be achieved at room temperature.

Tensile Strength N/mm ²	0.2% Proof stress, N/mm ² min.	Elongation % L=5d min.	Reduction in area % min.	Charpy Impact strength J min.
490-690	315	20	40	27 *

* Average of 3 charpy-V notch specimens, where the smallest value shall be atleast 21J.



**PLANT PURCHASING
SPECIFICATION
HYDERABAD**

HY19572

REV. NO.06

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7.0 SCOPE OF THIRD PARTY INSPECTION:

Whenever, separate quality plan is not attached, the scope of third party inspection shall be as follows:

1. Review of supplier's declared chemical composition.
2. Selection of test samples for mechanical tests and witness of the mechanical tests.
3. Witness of non-destructive tests as applicable.
4. Review of heat treatment charts.
5. Dimensional inspection.

	PLANT PURCHASING SPECIFICATION HYDERABAD	HY19573
		REV. NO. 06
		PAGE 1 OF 3

**ALLOY STEEL CASTINGS FOR STEAM TURBINES
FOR HIGH TEMPERATURE SERVICE**

GRADE : G 17 Cr Mo V 510

1.0 GENERAL:

This specification governs the quality requirements of castings required to operate at high pressure and elevated temperatures in steam turbines.

2.0 APPLICABLE ADDITIONAL SPECIFICATION:

General requirements of steel castings shall be as per plant standard HY0851165 Rev.01 (based on TLV 0100).

3.0 CHEMICAL COMPOSITION:

Heat analysis according to EN10213 in weight % shall be as follows:

Element	Melt analysis	
	Minimum	Maximum
C	0.15	0.20
Si	-	0.60
Mn	0.50	0.90
S	-	0.015
P	-	0.020
Mo	0.90	1.10
Cr	1.20	1.50
Ni	-	0.70
V	0.20	0.30
Cu	-	0.30
Al	-	0.040
Ti	-	0.025
Sb	-	0.010
Sn	-	0.025

4.0 WELDING:

Welding as per approved WPS and PQR shall be performed only on quenched and tempered castings. Design welds are allowed only after permission from BHEL.

Revisions: Revised the cross referred standard in cl. 2			Issued : STANDARDS ENGINEERING DEPARTMENT		
Rev.No. 06	Amd.No.	Reaffirmed:	Prepared: MATLS. ENGG.	Approved: GM (ENGG.)	Dt .of 1st issue AUG. 1983
Dt. MAY, 07	Dt.	Year:			

HY19573	PLANT PURCHASING SPECIFICATION HYDERABAD	
REV. NO. 06		
PAGE 2 OF 3		

The welding filler materials shall be in accordance to the WPS and shall have the following analysis (%).

C	= 0.10 – 0.15
Si	= 0.50 max.
Mn	= 1.0 max.
Cr	= 1.00 – 1.50
Mo	= 0.90 – 1.30
V	= 0.20 – 0.30
Ni	= 0.40 max.

The use of other welding filler material is only allowed after prior agreement with the purchaser. On each casting, weld hardness shall be checked at random and documented accordingly. Values of maximum 320 HV or 304 BHN max. are allowed.

5.0 **HEAT TREATMENT:**

According to EN10213.

Hardening: At temperature 920 - 960°C, holding time corresponding to the wall thickness. Depending on the wall thickness, cooling to be done in oil or an adequate liquid or circulated air.

Tempering: At temperature 680 - 740°C, holding time corresponding to the wall thickness. Cooling at calm air or cooling in furnace down to 300°C, then calm air. With respect to optimum long – term properties a microstructure transformation in the upper bainite range is to be achieved. After rough machining in the foundry, stress relieving treatment is necessary before delivery of the casting. The stress relieving temperature should not be more than the actually applied tempering temperature. The cooling rate for the stress relieving should be $\leq 30^\circ\text{C/hr}$ down to $\leq 300^\circ\text{C}$.

The stress relieving after rough machining can be dropped, if production welding followed by stress relieving is carried out after rough machining.

6.0 **MECHANICAL PROPERTIES:**

The mechanical properties of each casting shall be determined on attached samples in the delivery condition.

The following properties shall be achieved at room temperature.

Tensile strength N/mm ²	0.2% Proof stress, N/mm ² min.	Elongation % L=5.65 √So min.	Reduction in area % min.	Charpy impact strength * J min.
590-780	440	15	40	27

* Average of three charpy V-notch specimens, where the smallest value shall be at least 21 J.



PLANT PURCHASING SPECIFICATION HYDERABAD

HY19573

Rev. No. 06

PAGE 3 OF 3

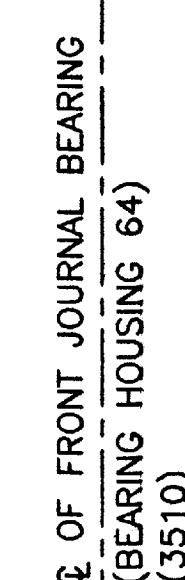
7.0 SCOPE OF THIRD PARTY INSPECTION:

In case of non-availability of any specified quality plan, following will be the scope of third party inspection agency.

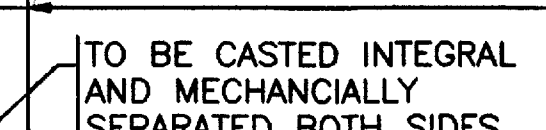
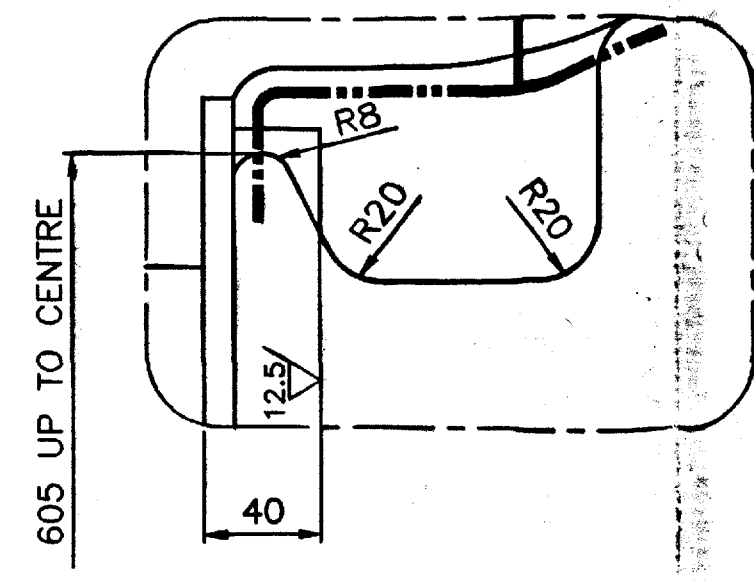
1. Review of chemical composition report.
2. Selection/identification of test specimen for physical tests before detaching from the casting.
3. Witness of all physical tests and NDT as applicable.
4. Review of heat treatment cycles followed.
5. Dimensional inspection.

INVENTORY NO	SIGN AND DATE	REF. PROC. NO.	COMPUTER FILE NAME	MADE FROM
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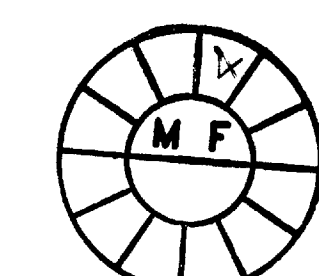


DETAIL-Y
SCALE 1:2.5



*** FOR ACCEPTABLE MANUFACTURING AND TESTING OF THE WELD JOINT BETWEEN FRONT AND REAR PORTIONS OF THE CASING, THE CASTING SUPPLIER MAY WELD THE SUPPORTING LUGS TO THE CASING SUBSEQUENTLY. THIS NOTE IS APPLICABLE ONLY IF THE FRONT AND REAR PORTIONS OF THE CASING ARE CAST SEPARATELY.

19	9		
18	9		
17	163	37	23
16	6	36	23
15	6	35	89
14	13	34	115
13	13	33	67
12	1221	32	71
11	343	31	30
10	100	30	17
9	33	29	70
8	33	28	36
7	2949	27	23
6	22	26	39
5	22	25	39
4	6	24	29
3	1202	23	29
		21	6144
POS	WT/(kg)	POS	WT/(kg)



21,23...37 3...19	GS 17CrMo 55	13010	00	HY 19572
POS	MATERIAL	Wt/KG	VAR	MATL.SPECN.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		
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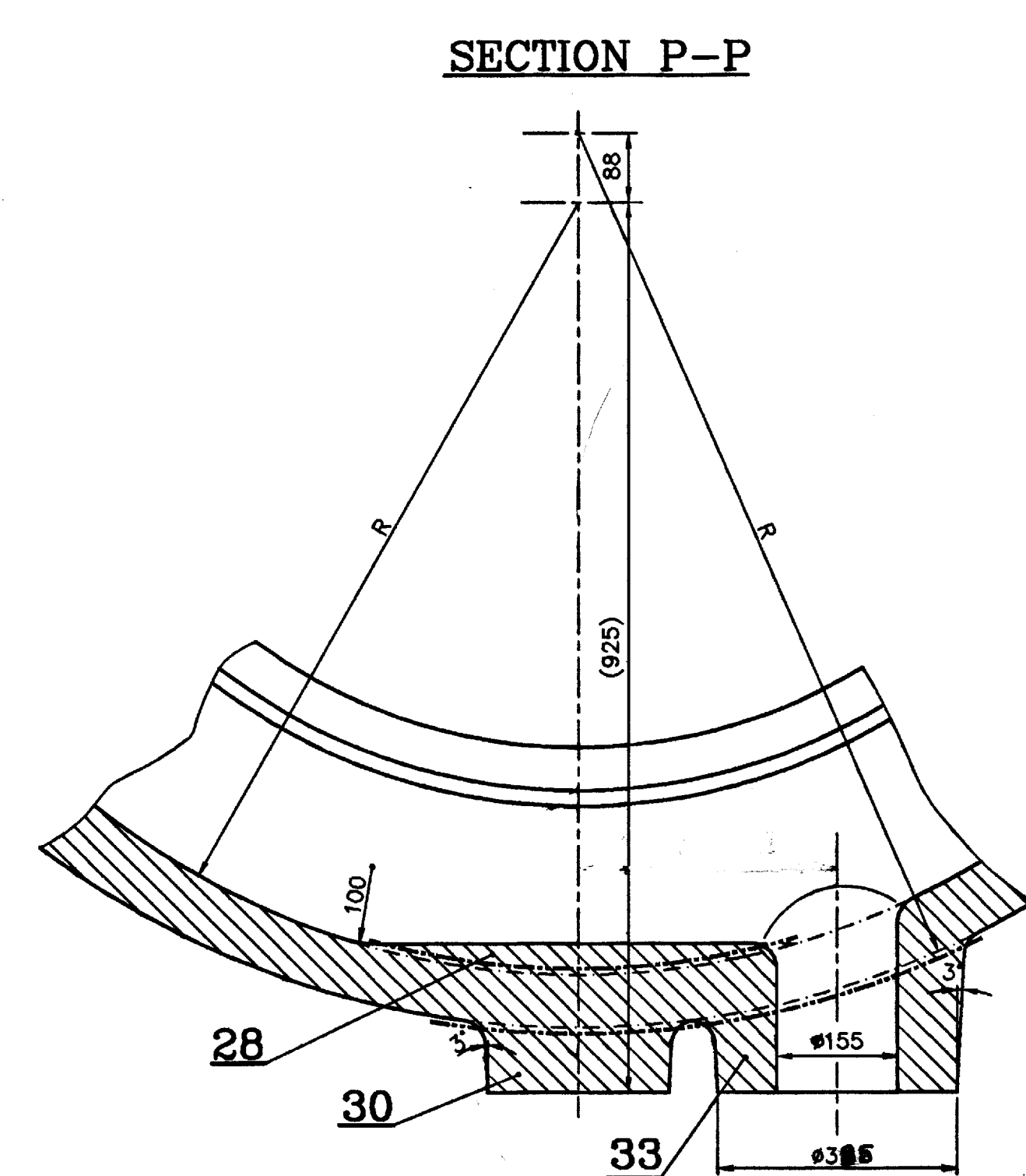
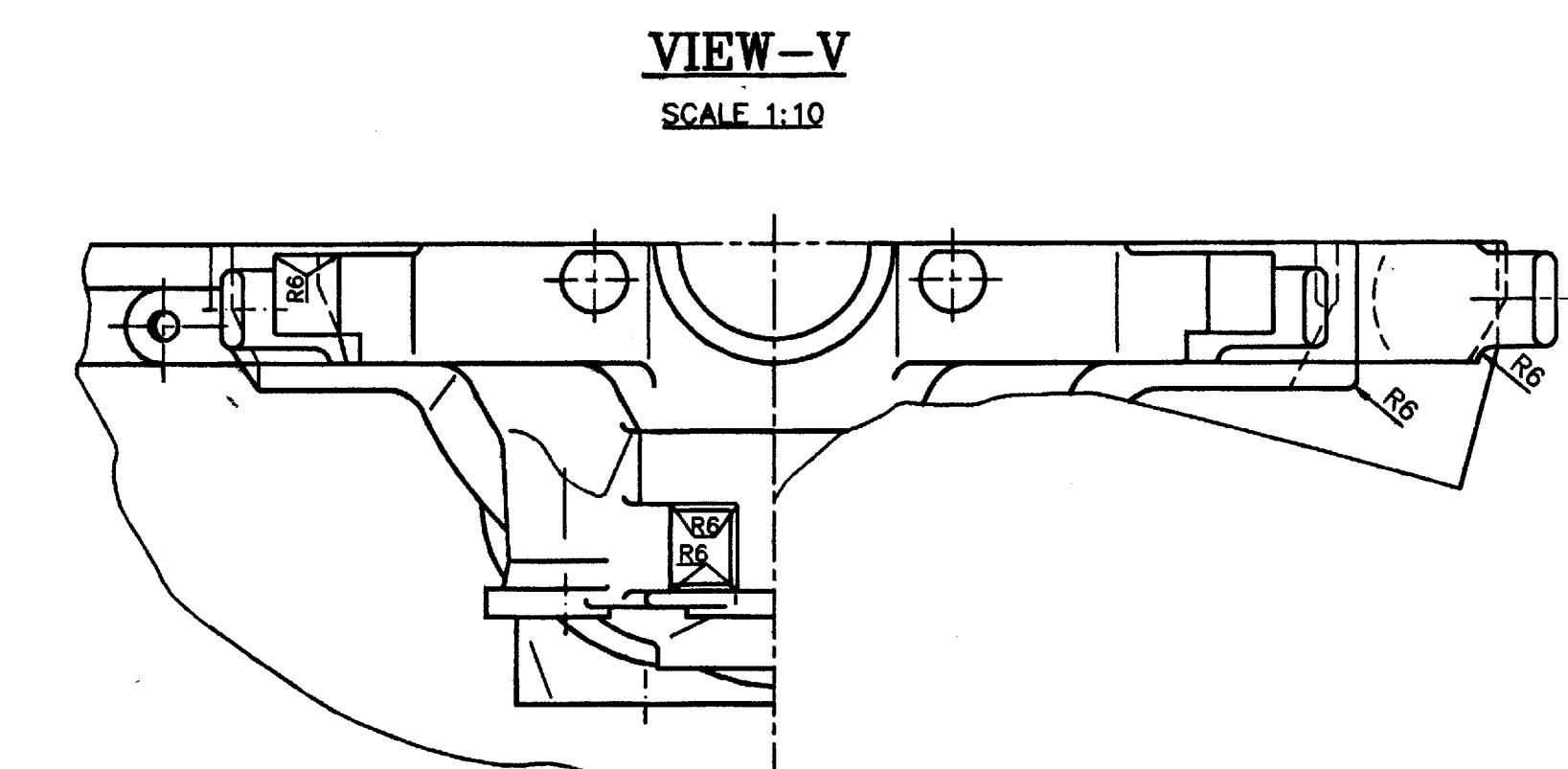
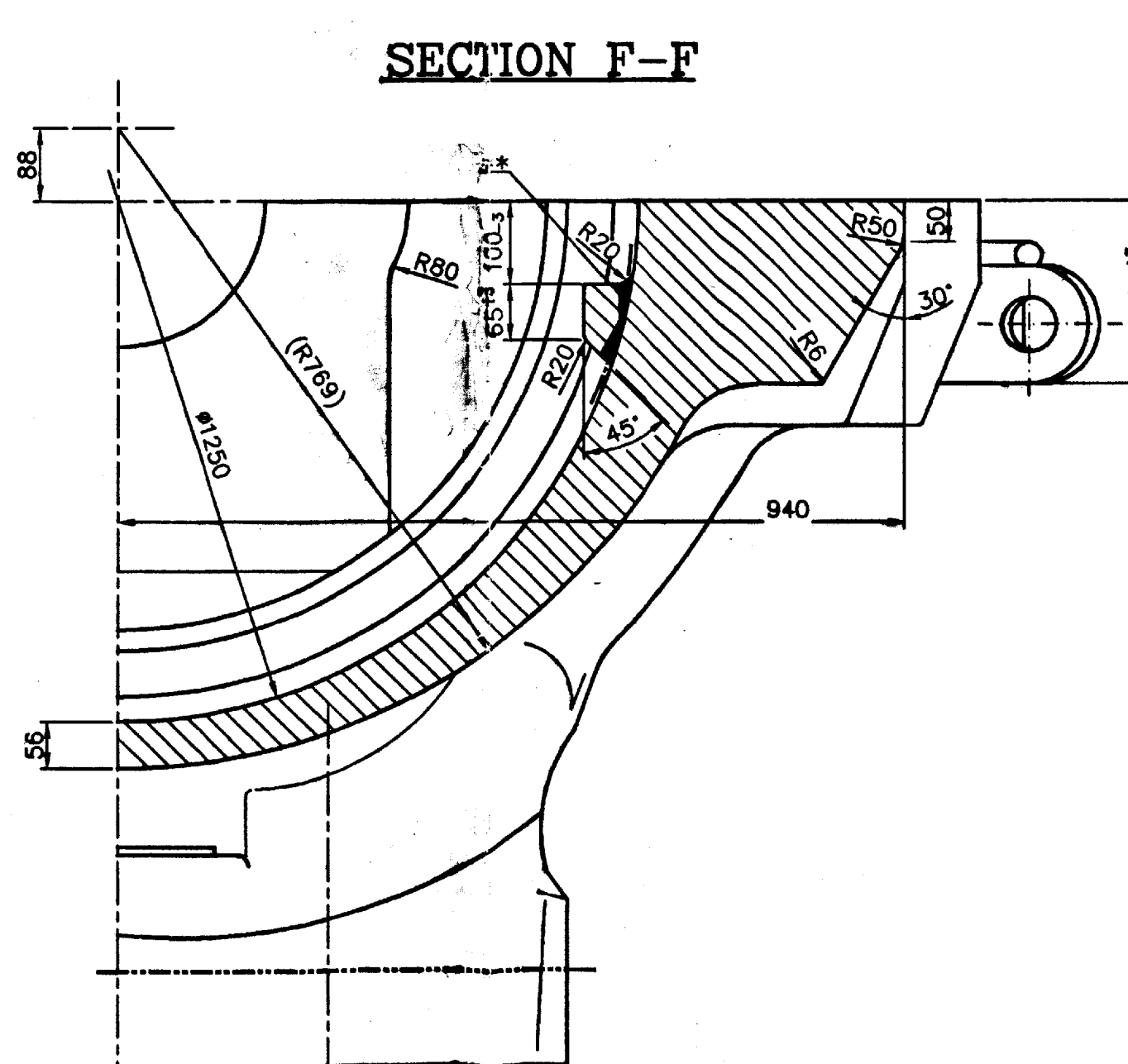
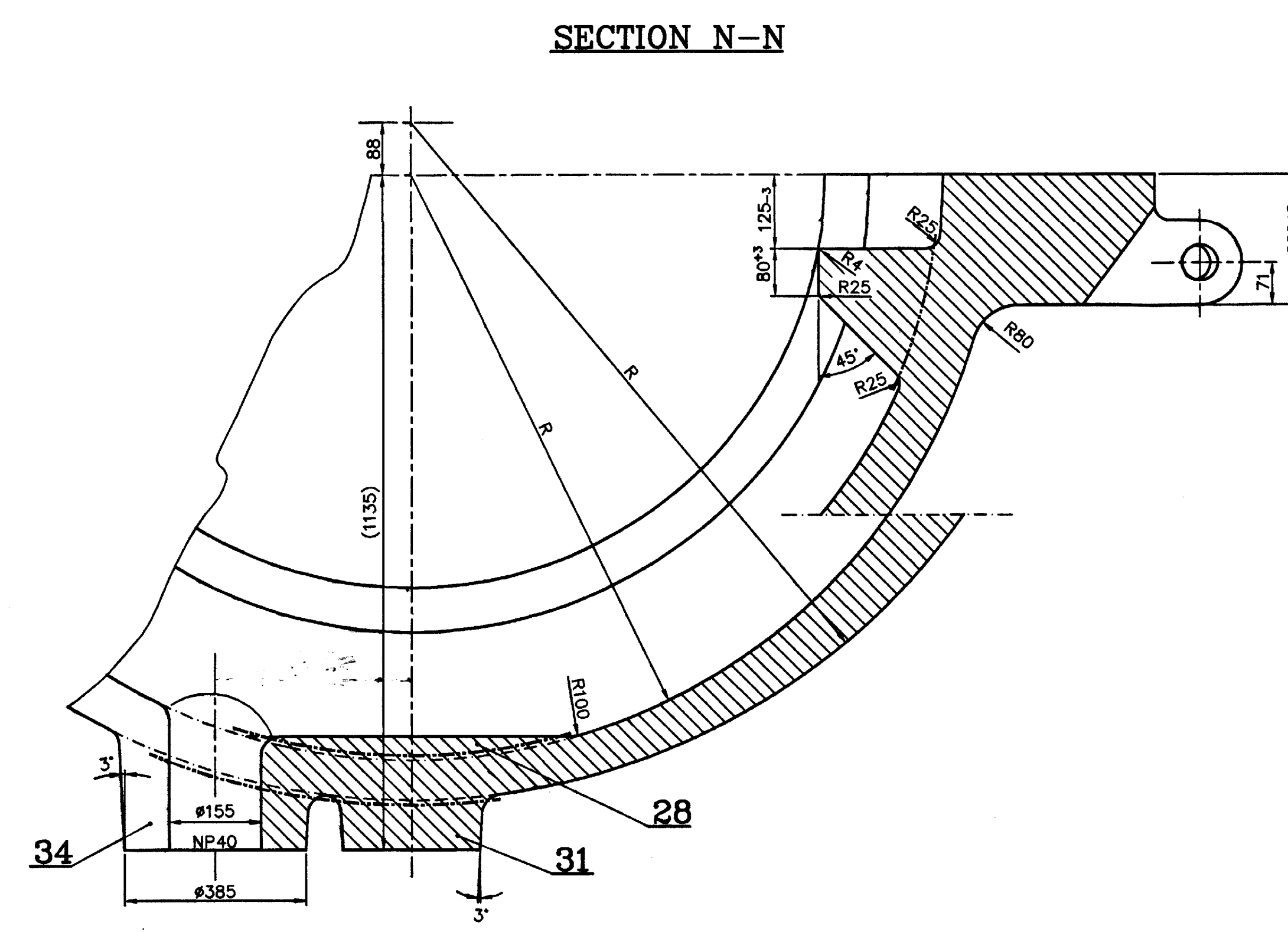
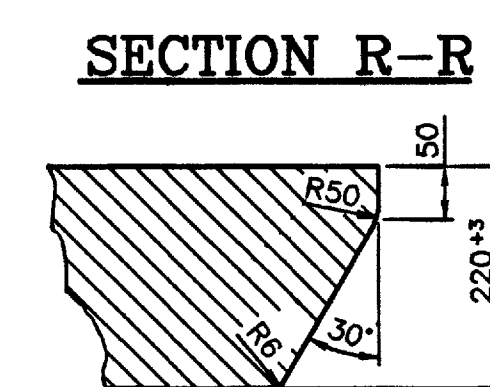
		BHARAT HEAVY ELECTRICALS LTD. HYDERABAD		<table><tr><th>NAME</th><th>SIGN.</th><th>DATE</th><th>NO. OF VAR.</th></tr><tr><td>DRN. G.R. RAO/P.C.C.</td><td></td><td>13-9-77</td><td></td></tr><tr><td>CHD. G.M. V. RAMANA</td><td></td><td>13-9-77</td><td></td></tr><tr><td>APPD. K. CH. PERAMAH</td><td></td><td>13-9-77</td><td></td></tr></table>				NAME	SIGN.	DATE	NO. OF VAR.	DRN. G.R. RAO/P.C.C.		13-9-77		CHD. G.M. V. RAMANA		13-9-77		APPD. K. CH. PERAMAH		13-9-77	
NAME	SIGN.	DATE	NO. OF VAR.																				
DRN. G.R. RAO/P.C.C.		13-9-77																					
CHD. G.M. V. RAMANA		13-9-77																					
APPD. K. CH. PERAMAH		13-9-77																					
DEPT. L.T.D.	UNITS. DIMS.		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF TIE-UPS																
CODE	OR PAGE		1/1	-NA-																			

TITLE		OUTER CASING - BZ (LOWER HALF)		CARD CODE	DRAWING NO.		REV.
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				SHT. No 01		NO. OF SHT. 02	

2
SHT. 02

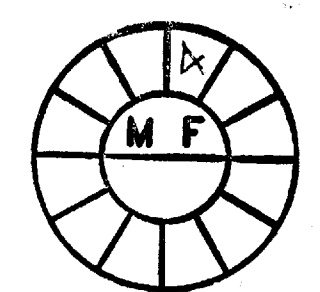
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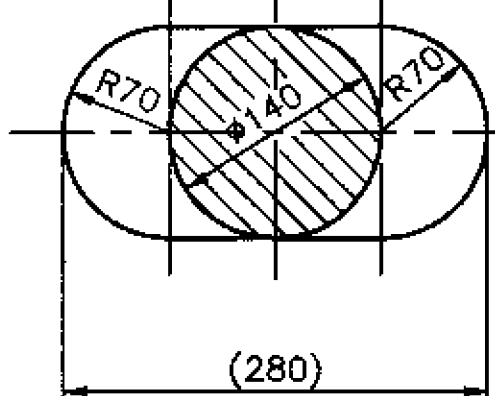
INVENTORY NO



**** THROUGH WELDING**

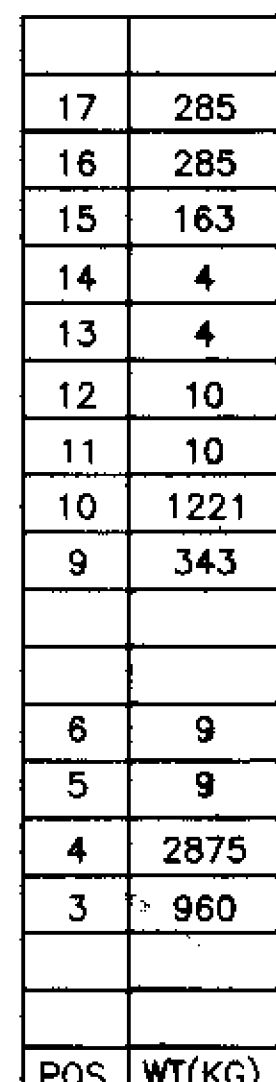
THIS NOTE IS APPLICABLE ONLY IF THE FRONT AND REAR PORTIONS OF THE CASING ARE CAST SEPARATELY AND WELDED TOGETHER

[illegible]



NOTES:-

1. CASTING IS TO BE SUPPLIED IN COMPLETELY ROUGH MACHINED CONDITION ACCORDING TO OUR PLANT PURCHASE SPEC. NOS. AS PER VAR. TABLE.
2. THE SUPPLIED CASTING SHOULD NOT CONTAIN ANY CHAPLETS AND CHILLS.
3. WELDED ON CORE PRINTS ARE TO BE MARKED BY CENTRE PUNCH.
4. THE GIVEN DRAWING DIMENSIONS ARE WITHOUT ANY MACHINING ALLOWANCE.
5. ADDITIONAL LOOSE PATTERN PIECES.
6. UNMENTIONED RADII R=32mm.
7. X-RAY TEST IS TO BE CARRIED AT THE POSITIONS MARKED THUS XXXXX.
8. THE FRONT AND REAR PORTIONS OF THE CASING CAN BE CAST SEPARATELY AND WELDED TOGETHER AT THE PLANE SHOWN IN THE DRAWING. OR, THE FRONT AND REAR PORTIONS CAN BE CAST TOGETHER AS A SINGLE PIECE IF THE FOUNDRY CAPACITY PERMITS.



1. (CONSISTING POS. NO. 3 TO 6 AND 9 TO 17)
2. (CONSISTING POS. NO. 19 AND 21 TO 28)

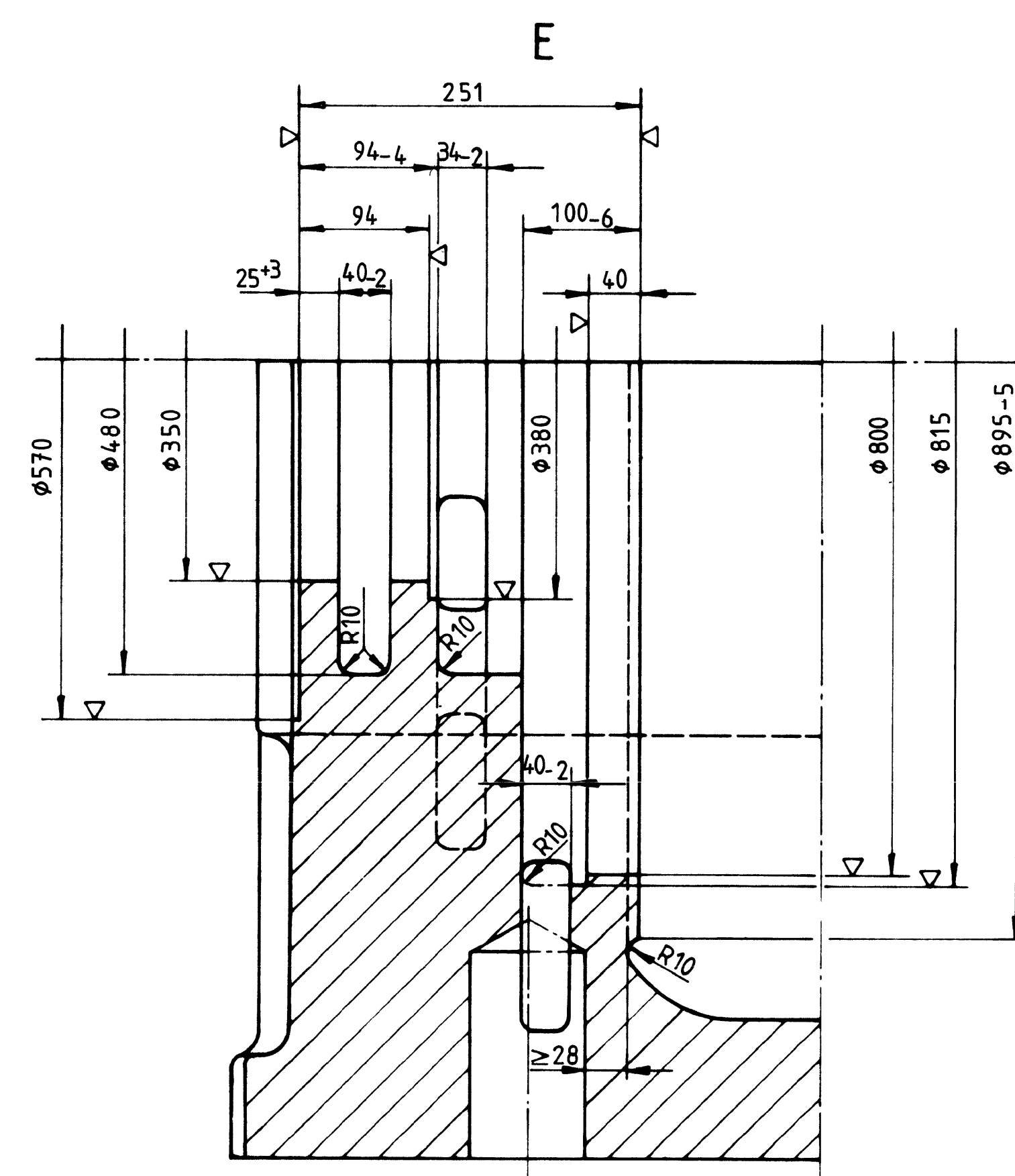
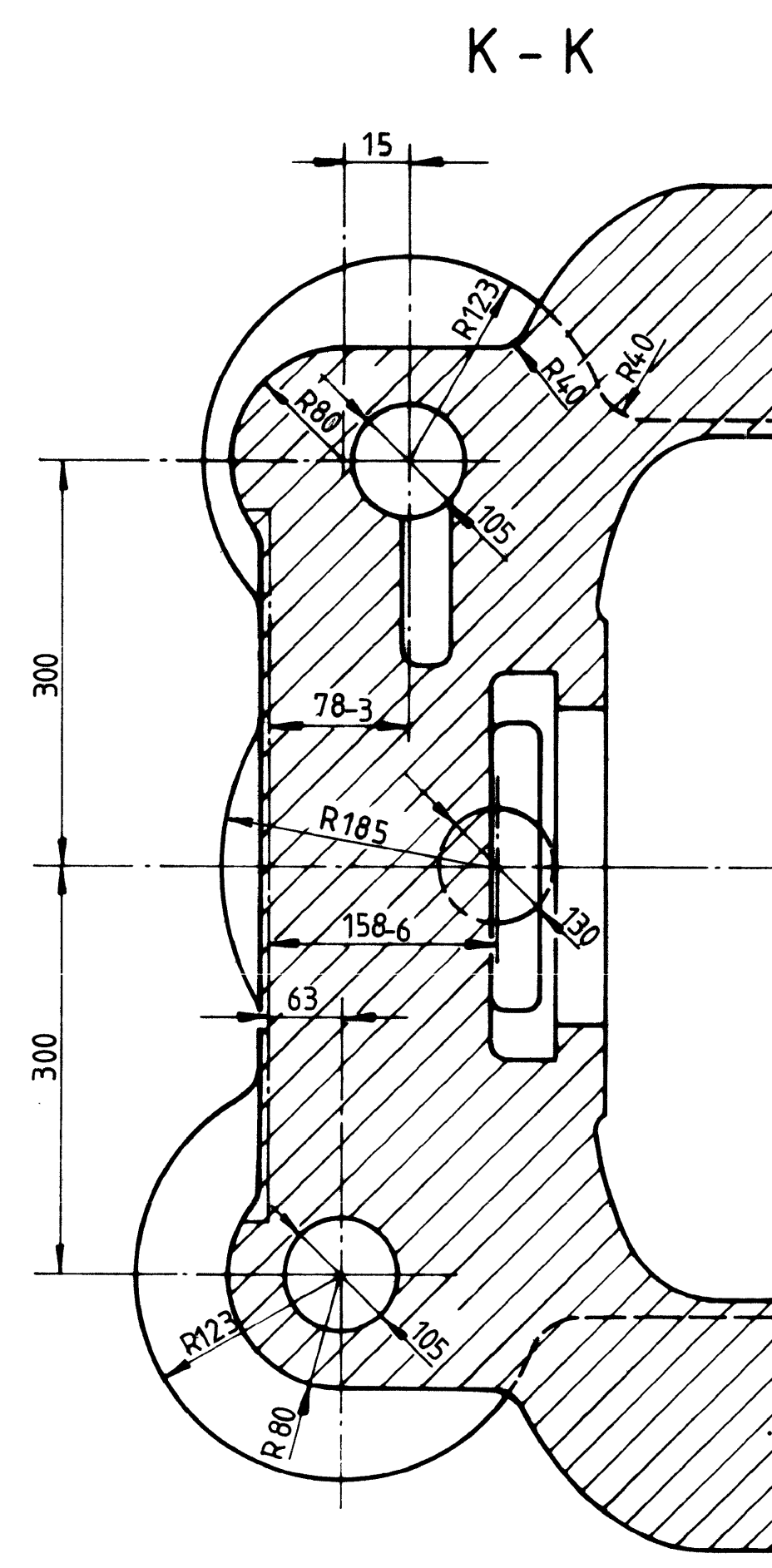
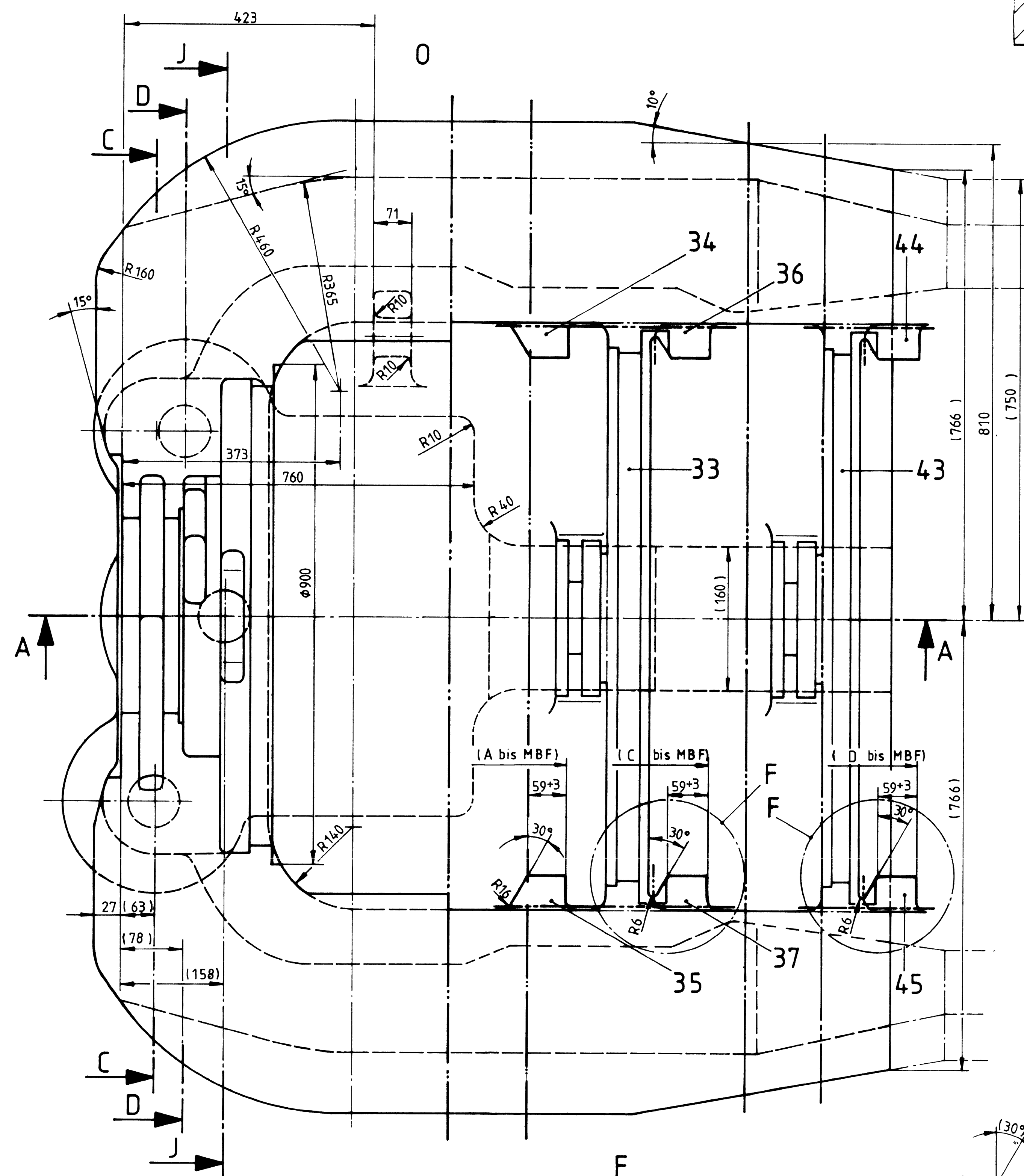
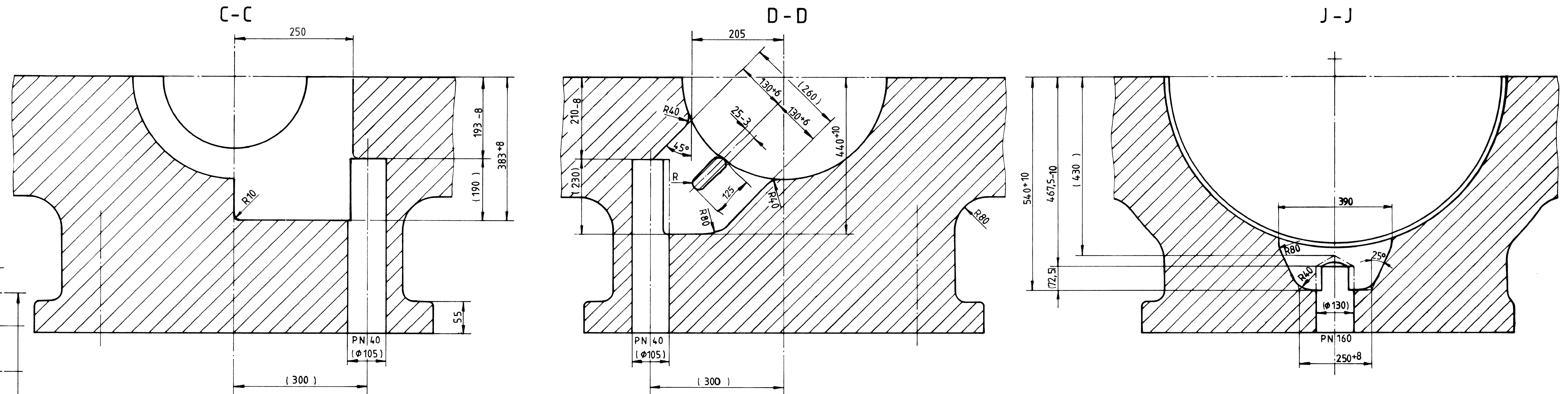
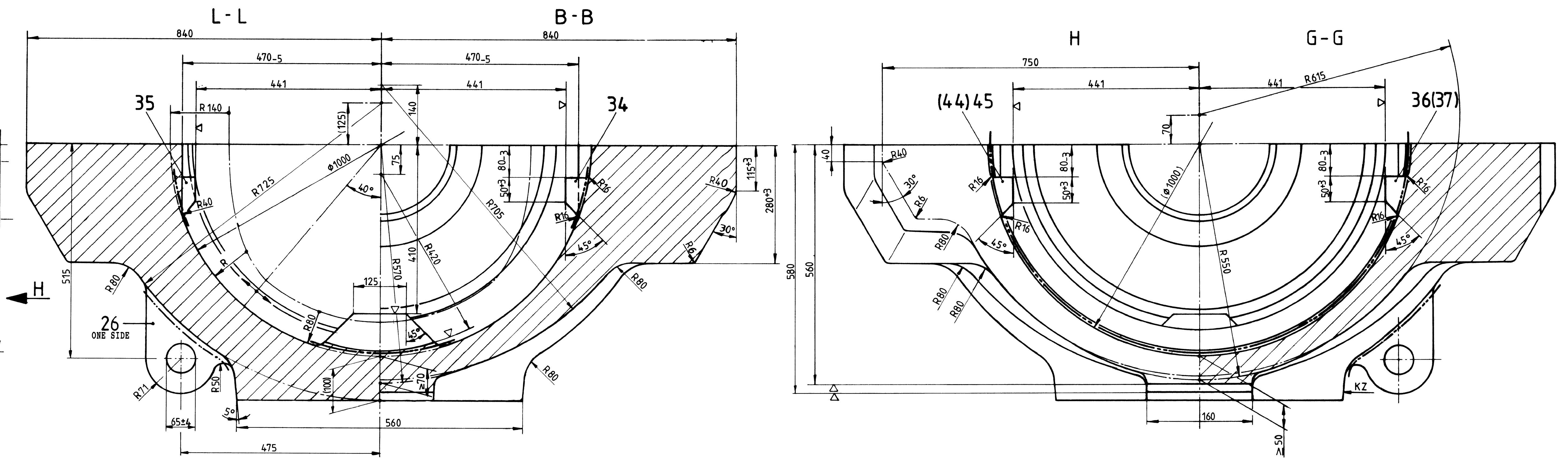
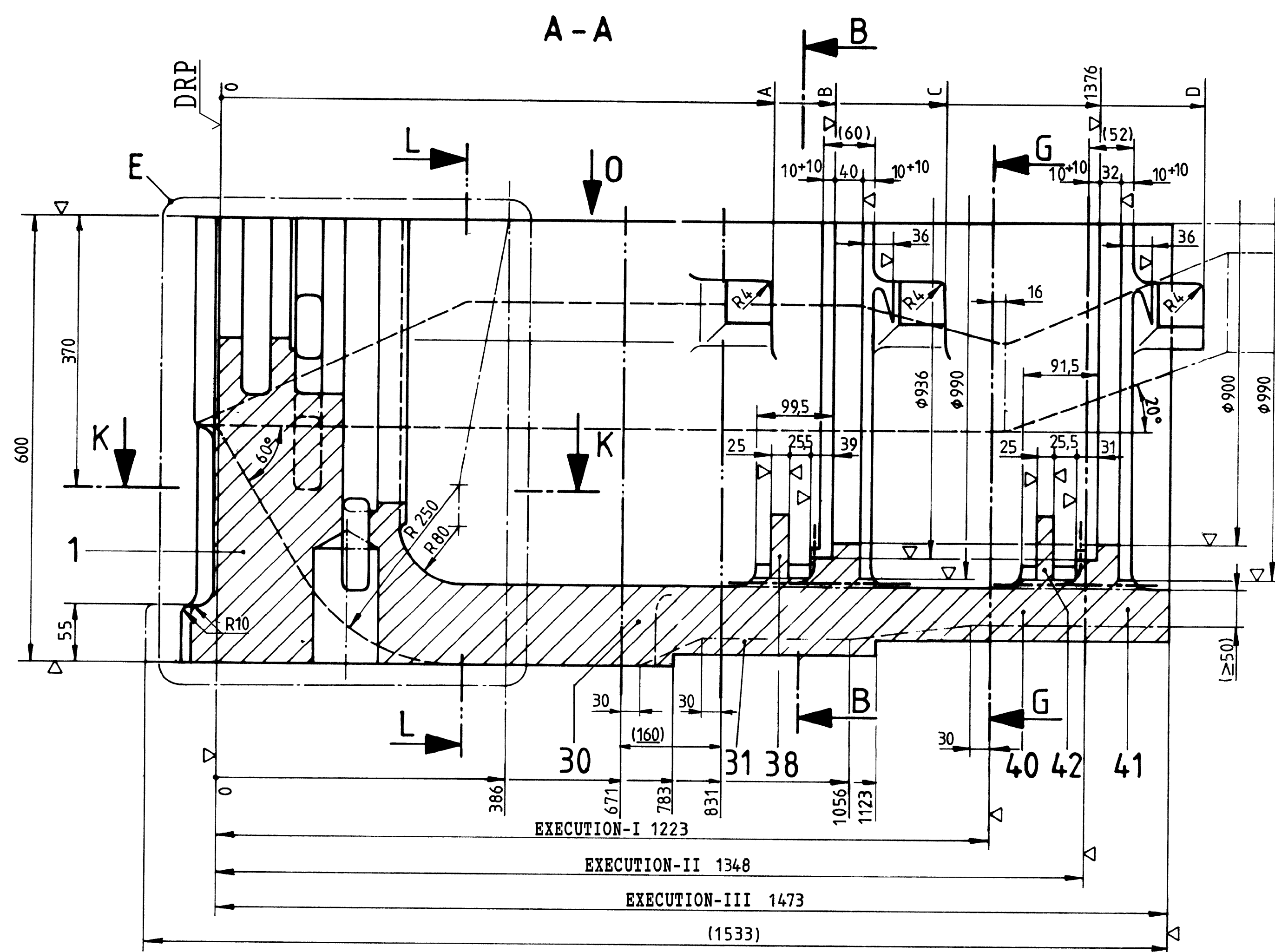
VALID POS. NO.	VAR.	WT. (Kg)	MATERIAL
			PURCHASE SP

TYPE OF PRODUCT
OR
NAME OF CUSTOMER/PROJECT

	NAME	SIGN.	DATE
DRN.	G.R.RAO/POC	<i>[Signature]</i>	13.8.99
CHD.	C.N.V.RAMANA	<i>[Signature]</i>	13.8.99
APP.	K.CH.VEERANNA	<i>[Signature]</i>	13.8.99

REV.	DATE	ALTERED	SYMT.	UNTL. DIMS.		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.
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ORIGINAL DRAWING			TITLE			DRAWING NO.		CARD CODE	
DRW : B.S.R			UPPER CASING-BZ			0-801-01		NA	
CRD : G.B.R			(UPPER HALF)			0-301-01-10341		NA	
APPD : G.B.R						SHT. No 01		No of SHT. 8	

SH. 01 OF 02	2
DRG. NO. 0-301-01-10560	



F
DESIGN IF CIRCUMFERENTIAL LUG
(ie POS 33 OR 43) IS NOT VALID

45	4,-
44	4,-
43	31,-
42	4,-
41	211,-
40	248,-
39	—
38	4,-
37	4,-
36	4,-
35	4,-
34	4,-
33	36,-
32	—
31	746,-
30	365,-
29	—
28	—
27	—
26	8
2	—
1	2232,-
Pos.	WEIGHT [kg]

1, 5, 6, 19, 20, 21, 22, 23, 24, 30, 31, 33, 36, 37	STEAM CHAMBER	I	—	808	945	—	05
1, 5, 6, 19, 20, 21, 22, 23, 24, 30, 31, 34, 37, 38	STEAM CHAMBER	I	—	766	903	—	04
1, 5, 6, 19, 20, 21, 22, 23, 24, 30, 31, 33, 36, 37	STEAM CHAMBER	I	—	766	903	—	03
1, 5, 6, 19, 20, 21, 22, 23, 31, 33, 38	SC / C	I	903	1008	1153	—	02
1, 5, 6, 13, 18, 30, 31, 33, 38, 40, 45, 75, 76, 77	SZ / Z	III	903	1008	1153	1513	01
1, 5, 6, 19, 20, 21, 22, 23, 24, 30, 31, 33, 36, 37, 38, STEAM CHAMBER (DA)	SC / C	I	903	958	1263	—	00
VALID POS. NO.	TYPE	EXECUT.	A	B	C	D	VAR

UNMENTIONED RADII = R40

-----..-----..----- LOOSE PATTERN PEICES
FOR POS 3 TO 25 SEE SHEET 2

TYPE OF PRODUCT OR
NAME OF CUSTOMER/PROJECT

	BHARAT HEAVY ELECTRICALS LIMITED					NO. OF VAR.
	HYDERABAD		DRN.	MAHESH/SCS	20.08.02	
			CHD.	MRB	20.08.02	
			APPD.	MRB	20.08.02	

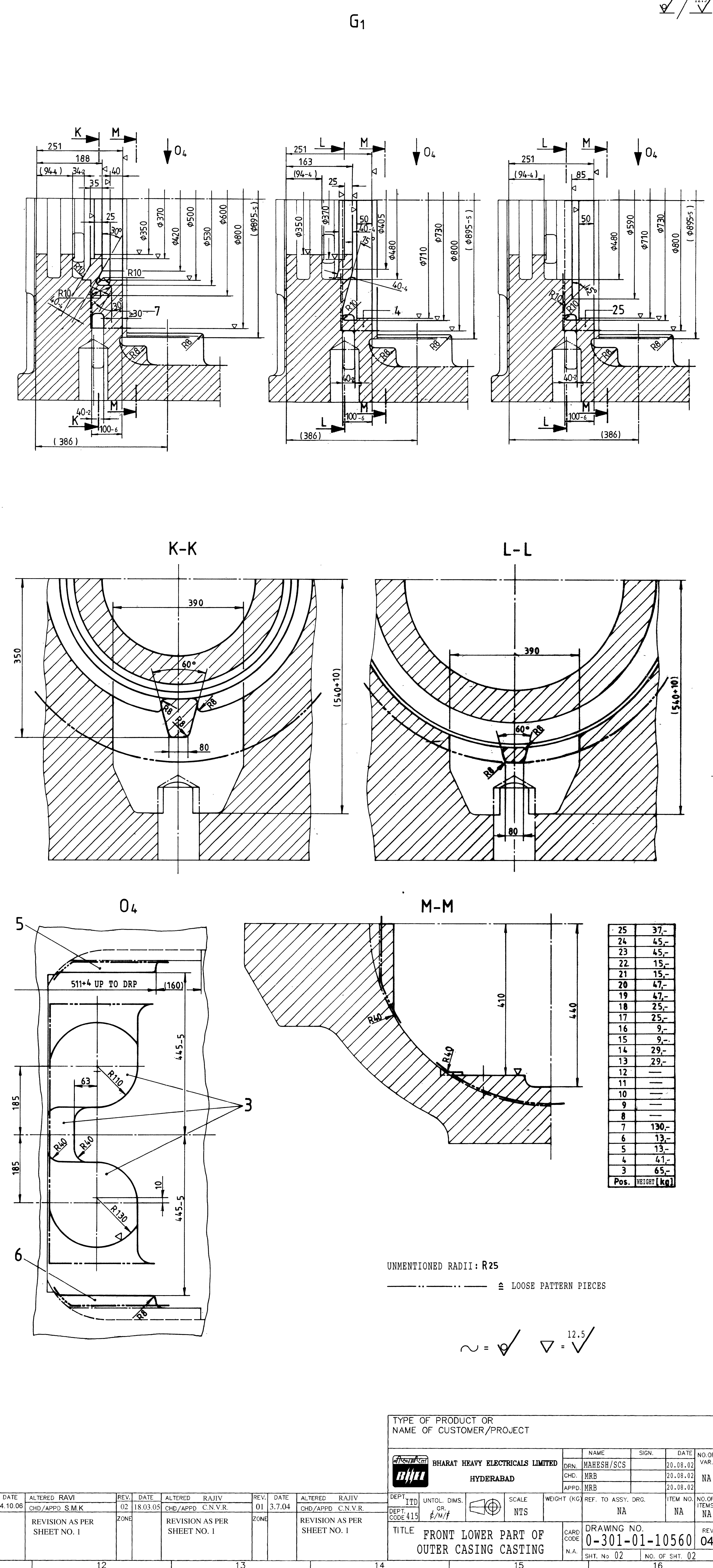
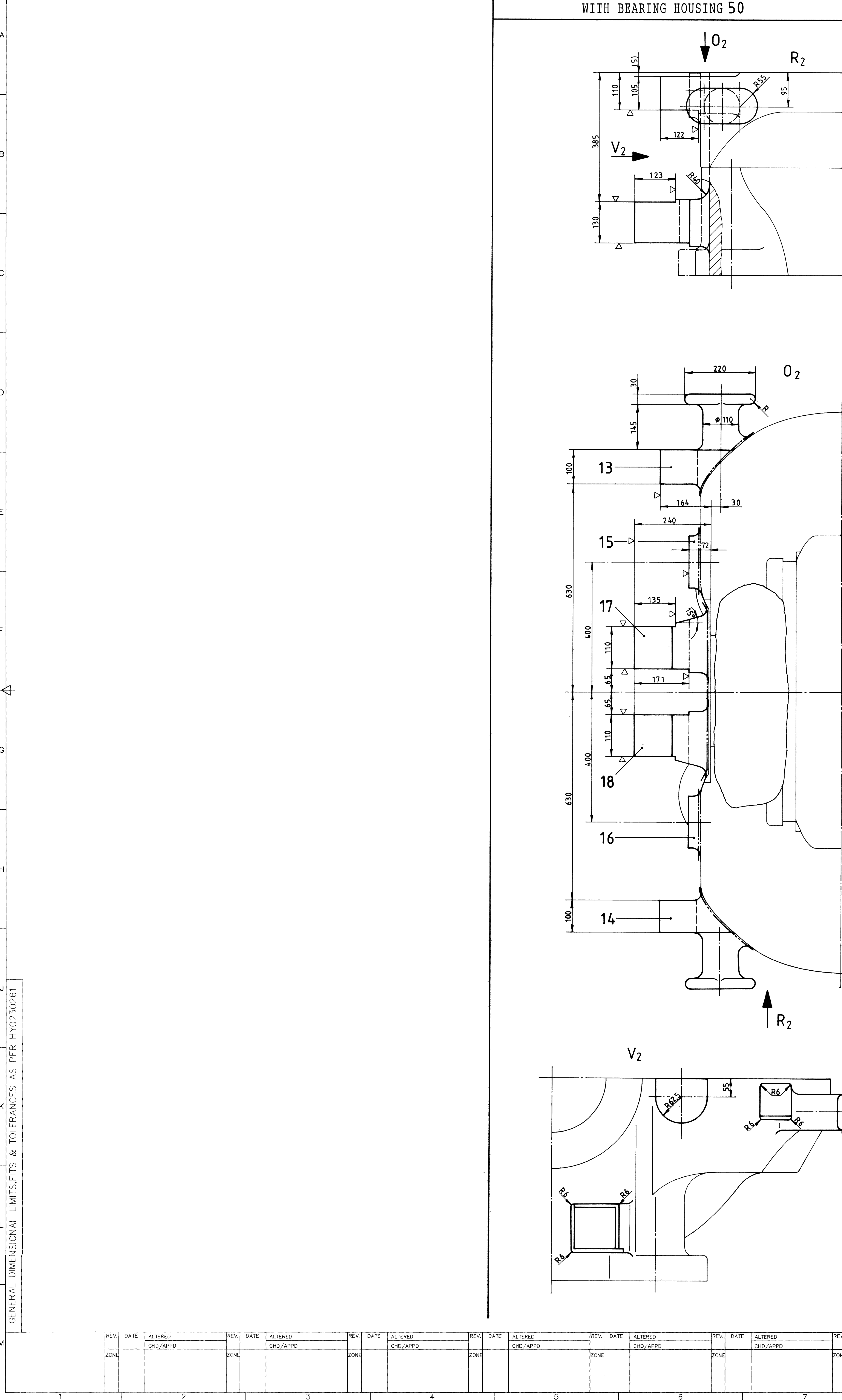
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TITLE FRONT LOWER PART OF OUTER CASING CASTING				CARD CODE	DRAWING NO. 0-301-01-10560		REV. 04
				N.A.	SHT. No 01 NO. OF SHT. 02		

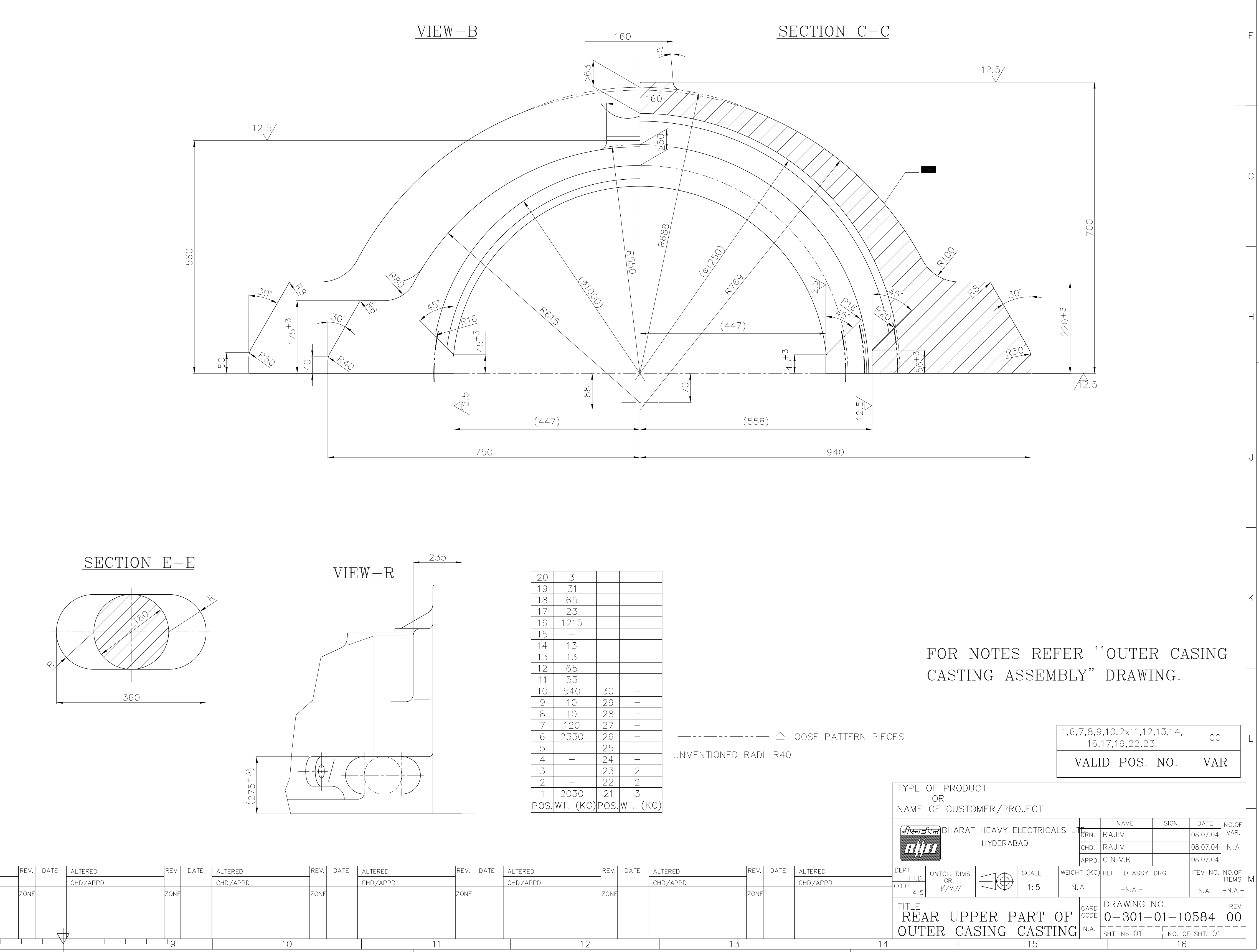
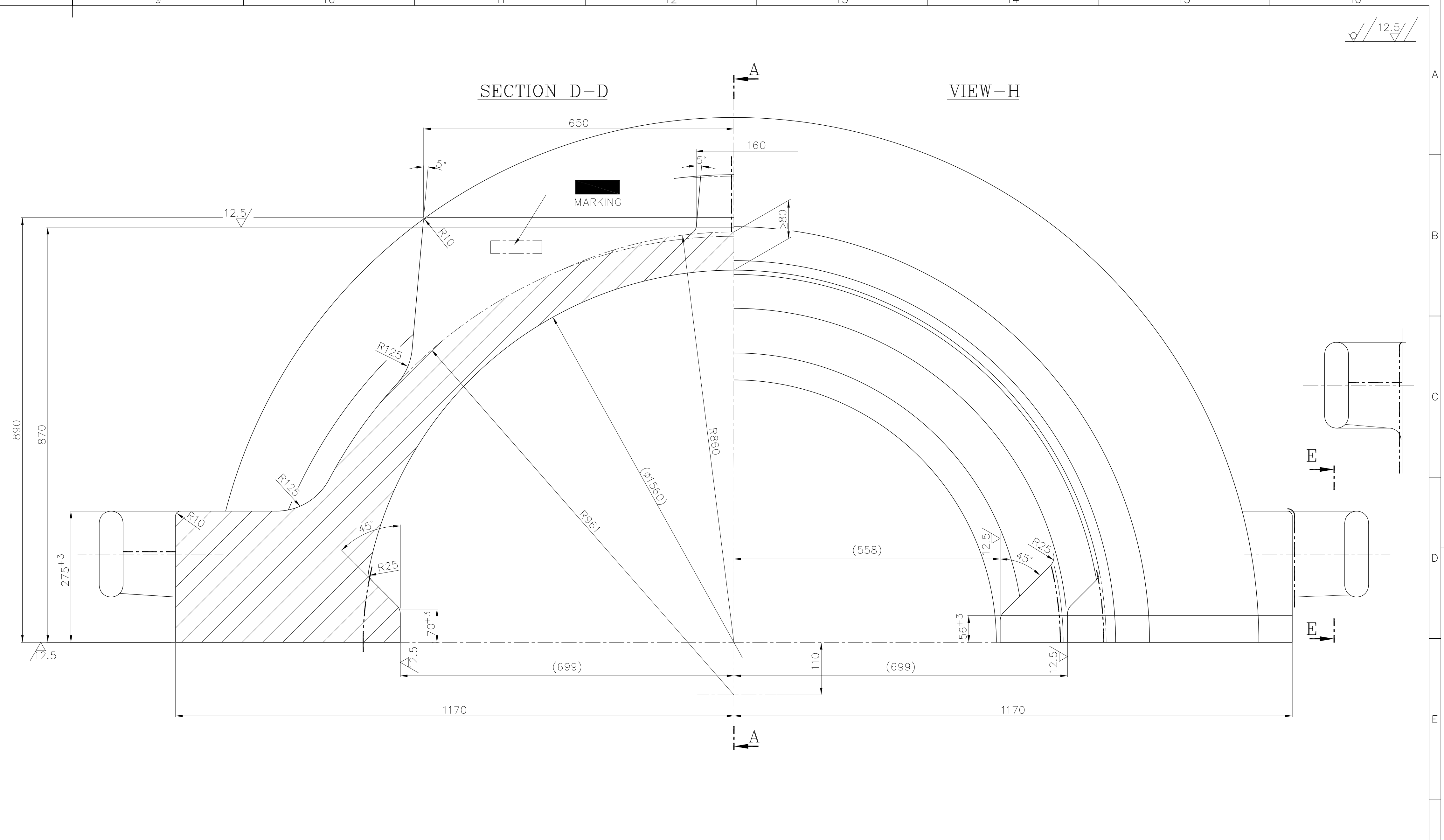
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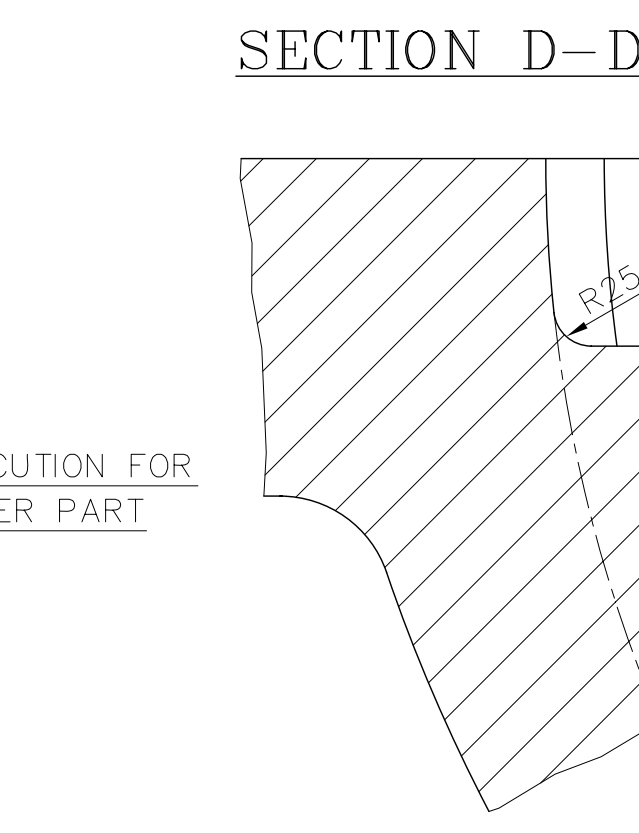
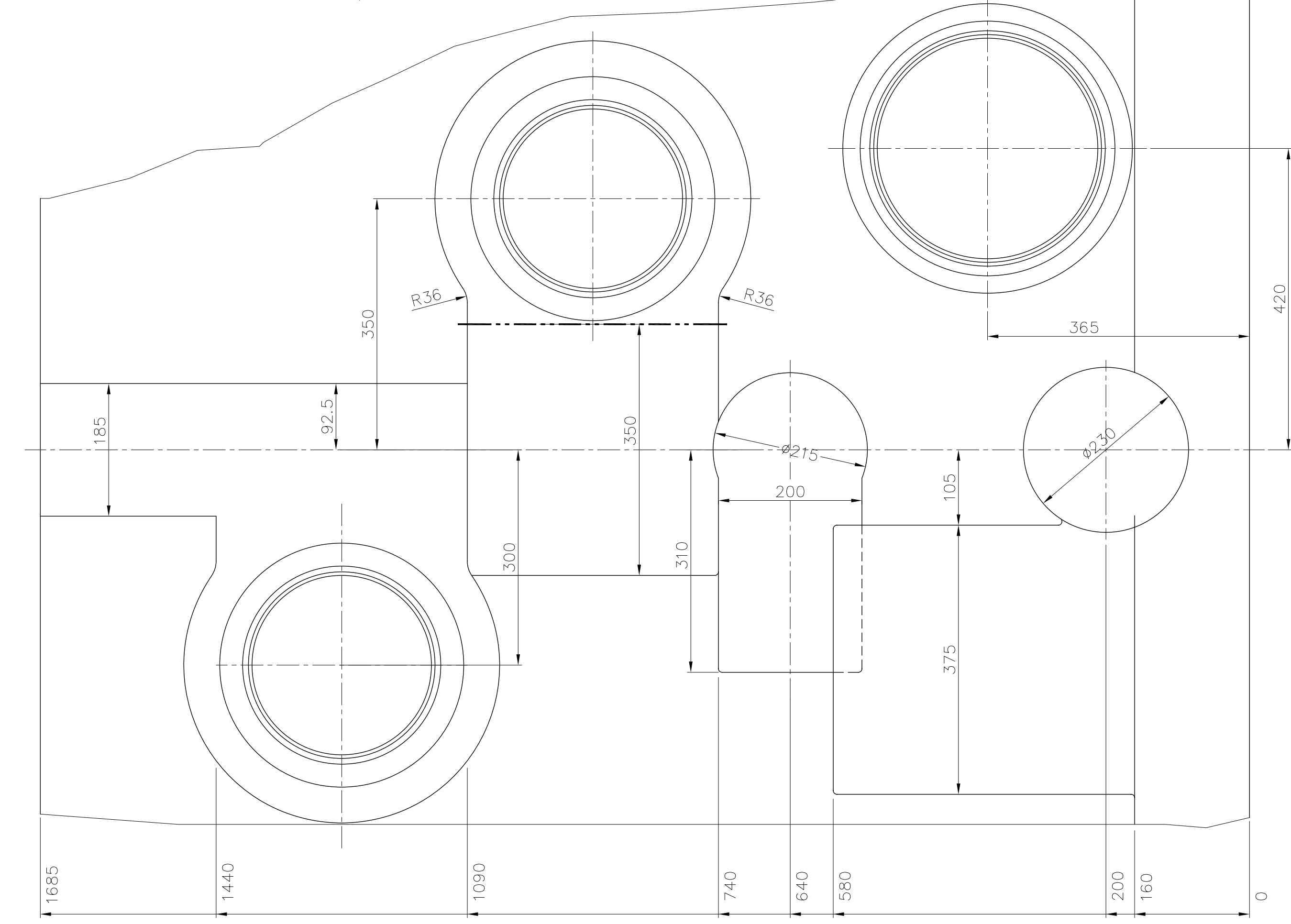
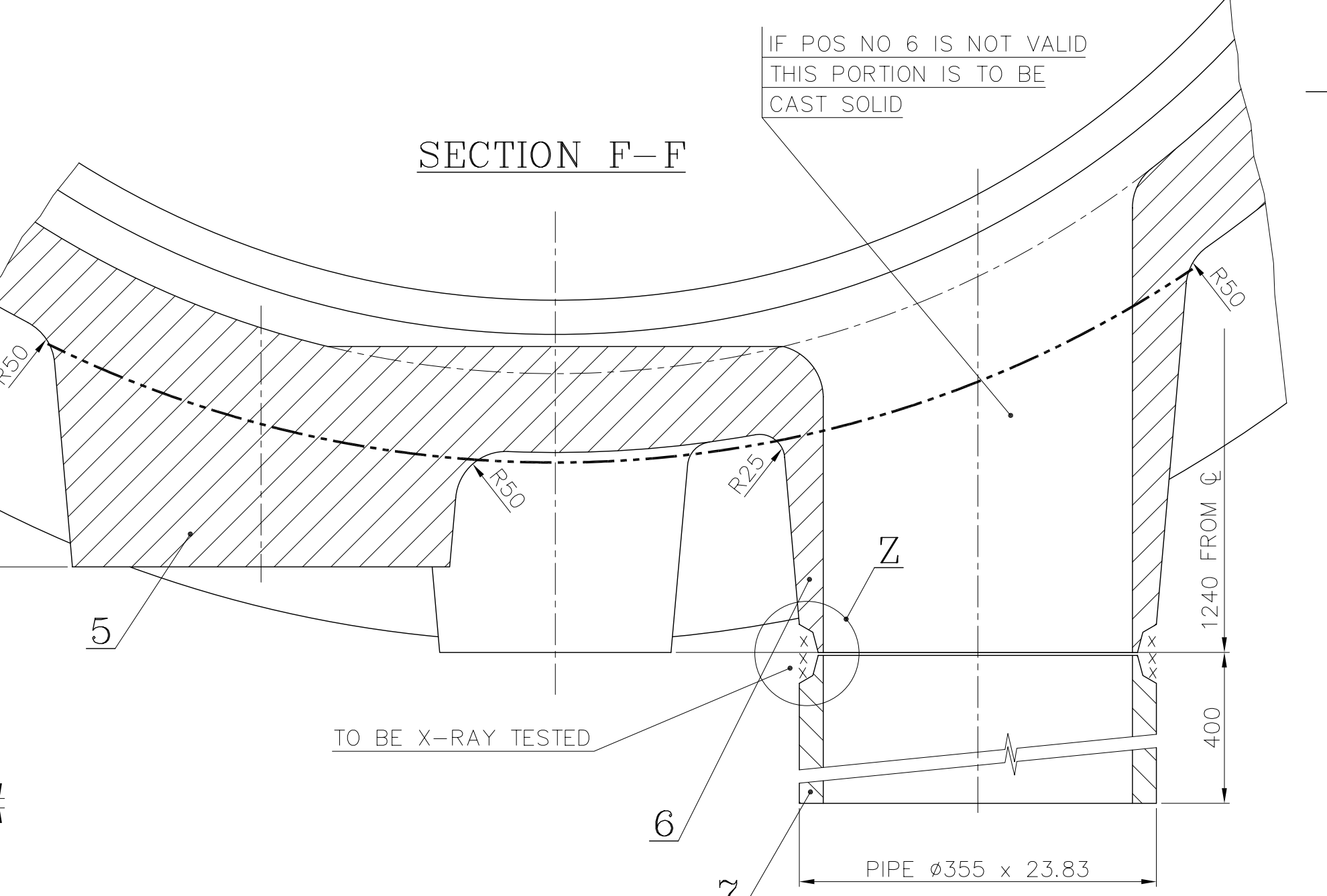
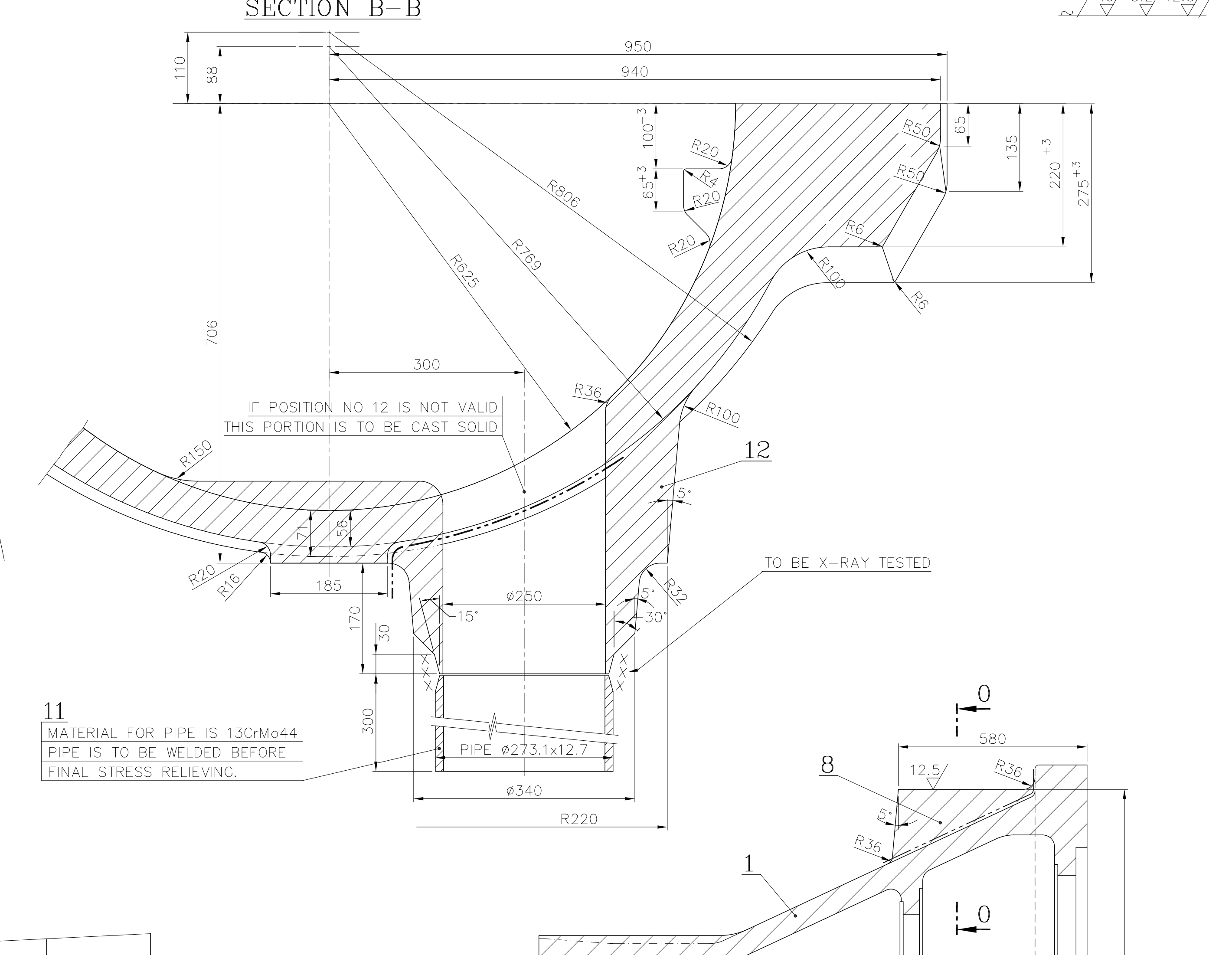
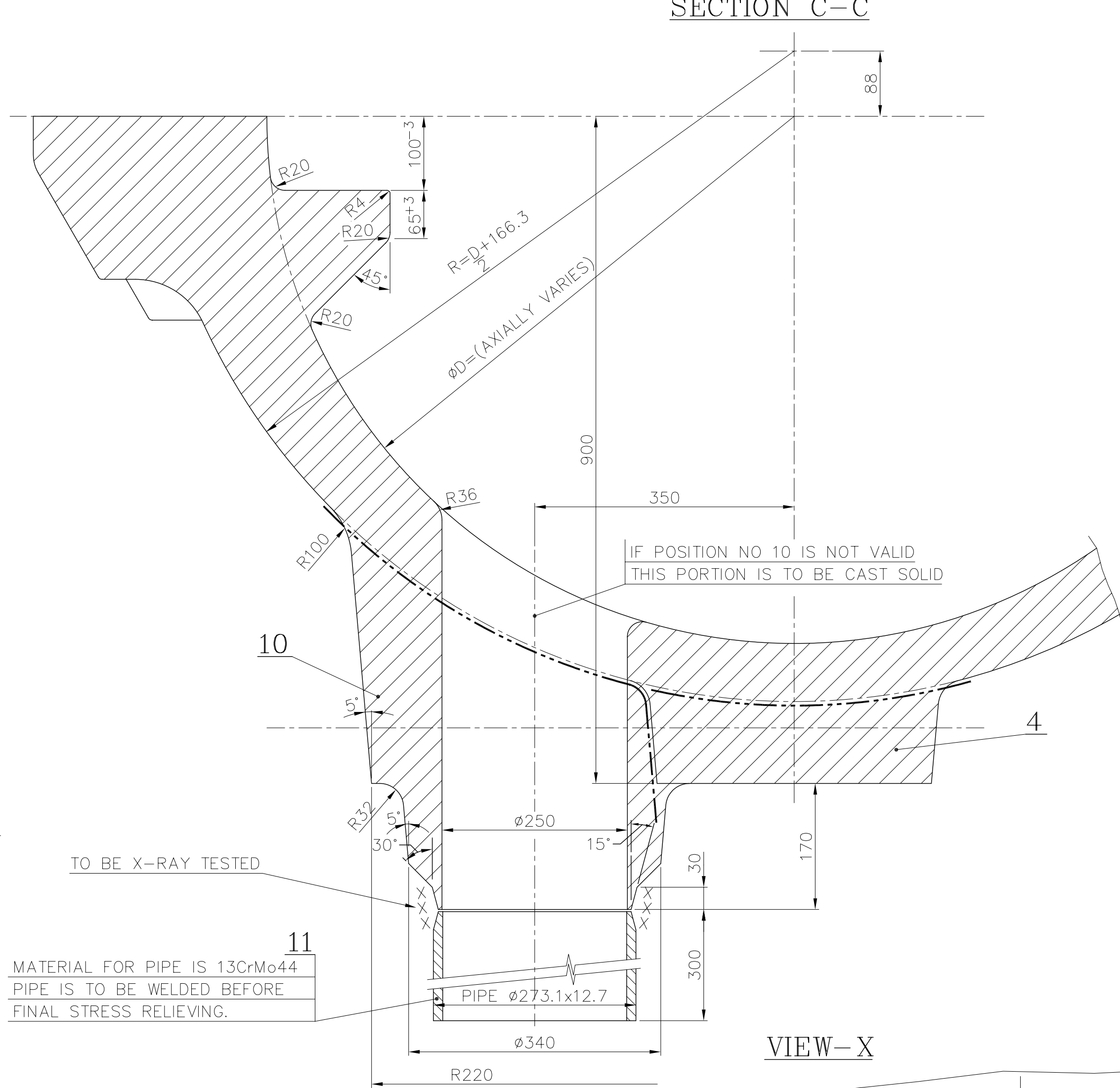
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

SON. AND DATE REV. APP. 20 9-2214-0111-34 REV'D 0

GENERAL DIMENSIONAL LIMITS/FITS & TOLERANCES AS PER HY0230261







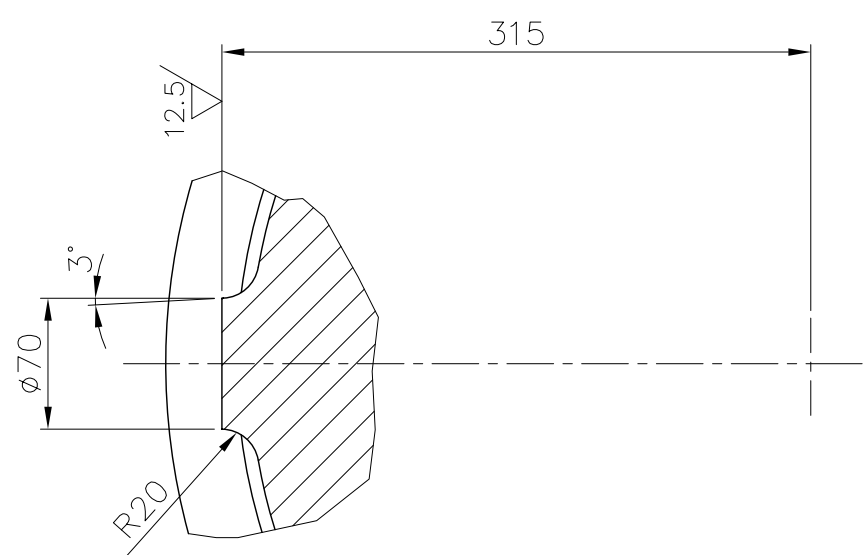
TITLE	OUTER CASING REAR PORTION (BZ)	CARD CODE	DRAWING NO. 0-301-01-10611	REV. 00
		N.A.	SHT. No. 01	NO. OF SHT. 01

DRG. NO. 1-301-01-10196

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

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

INVENTORY NO	SIGN. AND DATE	REF. ORG. NO.	COMPUTER FILE NAME
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NOTE:—

1. ALLOWANCES FOR MACHINING
UP TO 500 mm $5^{\pm 1}$
2. FOR DIMENSIONS OVER 500mm $8^{\pm 2}$
3. — — — — — LOOSE PATTERN
4. TEST PIECE TO BE PROVIDED
LOCATION AS PER SUPPLIERS OPTION.

PN 400, ASA 2500 lb

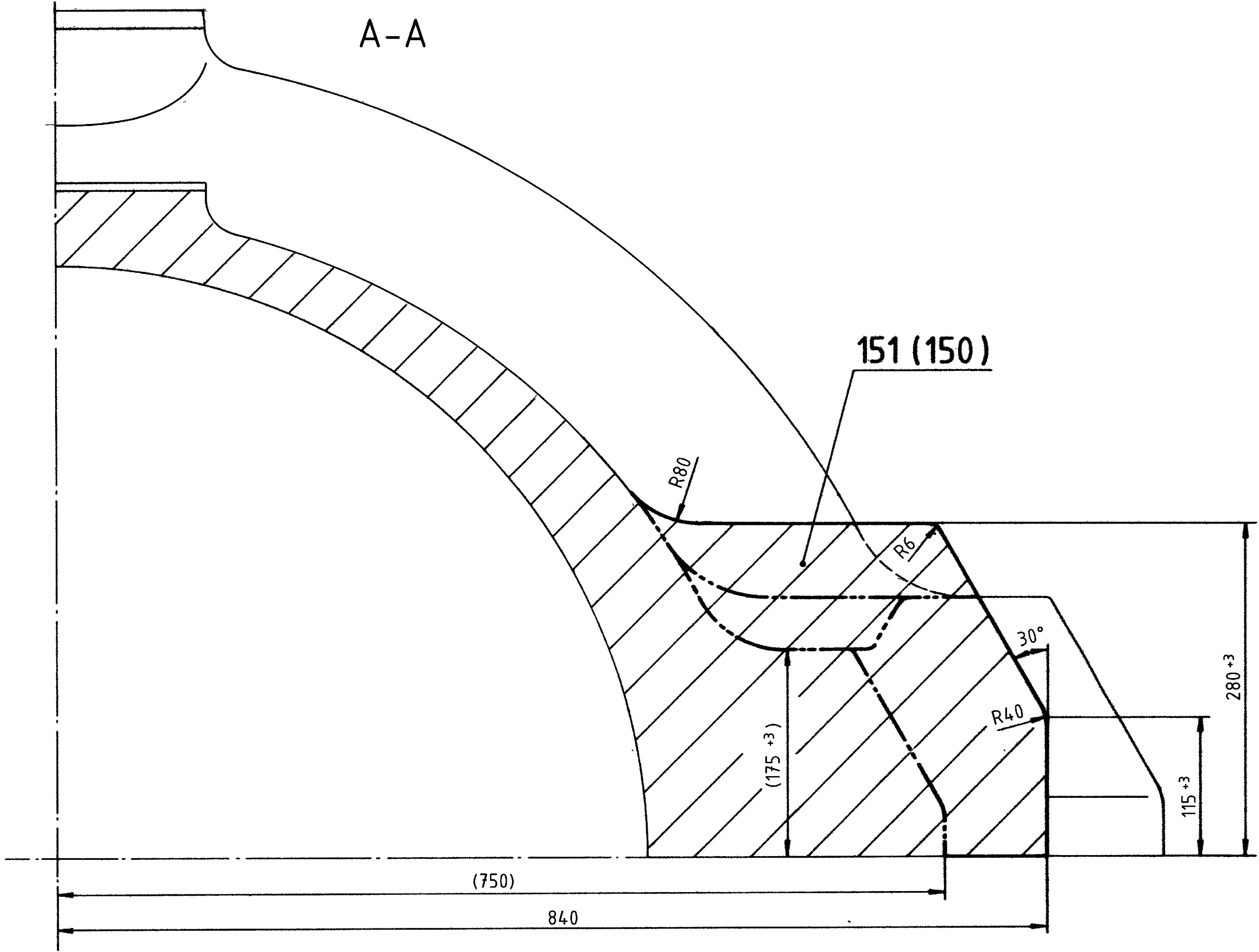
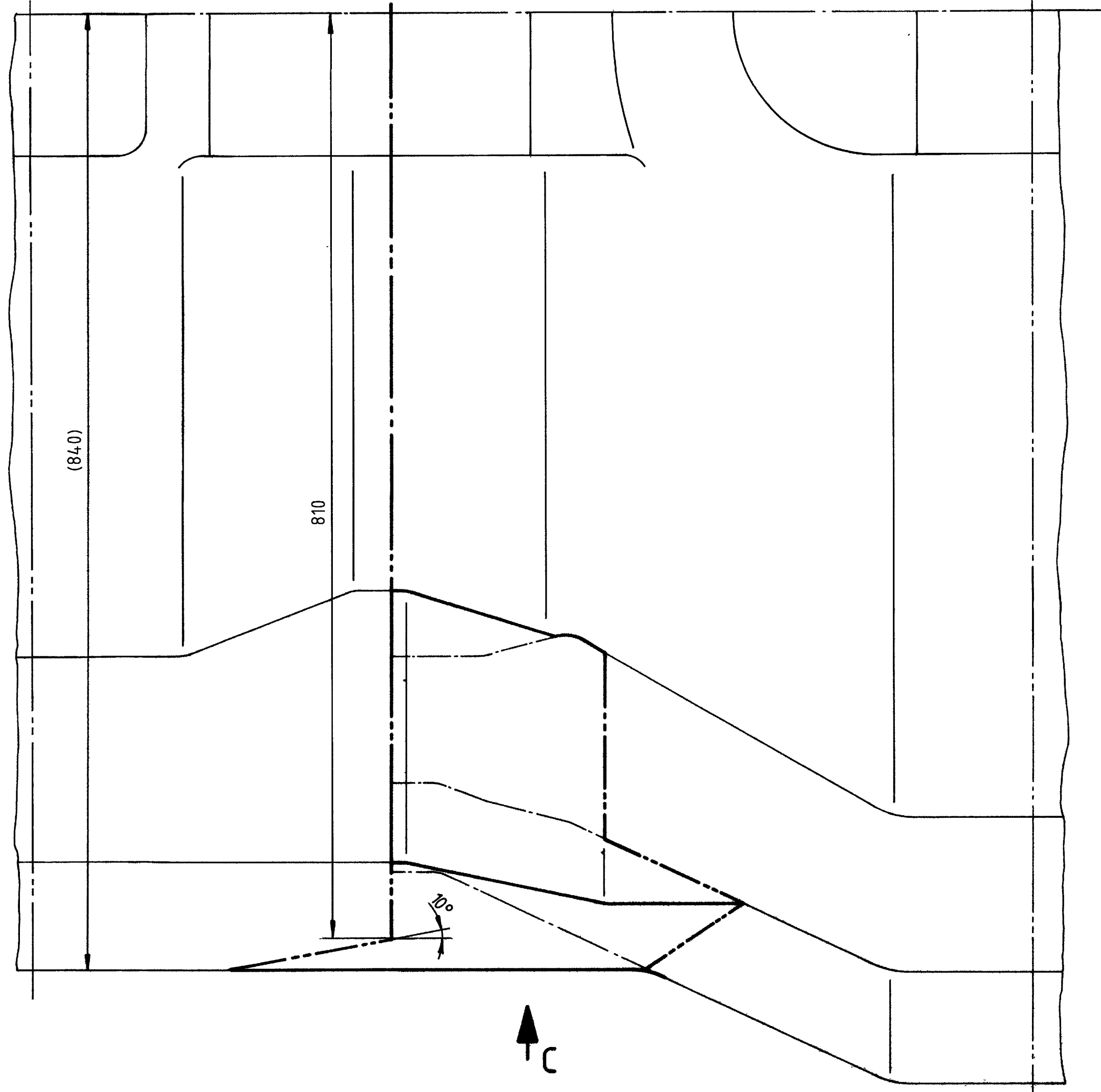
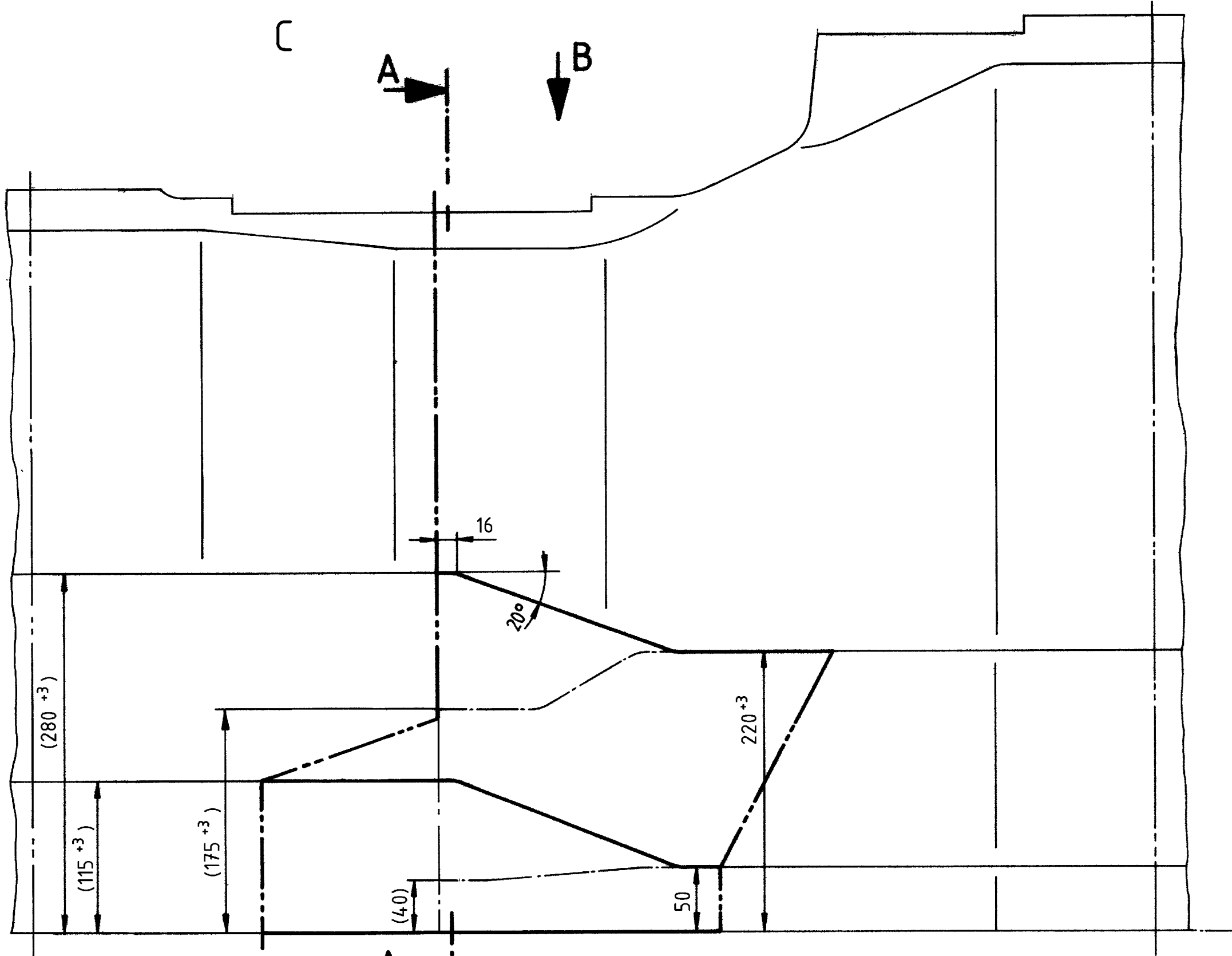
		1,2,3		G17Cr MoV5-10		04									
3		86.25		1		GS-17 Cr Mo 55		03							
2		30		1		GS-17 Cr Mov 511		02							
1		1230		1,2		GS-17 Cr Mo 55		01							
POS.		WEIGHT(kg)		1,2		GS-17 Cr Mov 511		00							
				POSITION		MATERIAL SPECATION		VARIANT-XX							
TYPE OF PRODUCT OR NAME OF CUSTOMER															
भारत भारती BHEL BHARAT HEAVY ELECTRICALS LTD. HYDERABAD				DRN.		NAME		SIGN.		DATE		NO.OF VAR.			
SCALE 1:5				CHD.		POORNIMA CAD				17.09.01		—NA—			
				APPD.		G.R.RAO				17.09.01		—NA—			
				C.N.V.R				17.09.01		—NA—					
DEPT. I.T.D CODE 415		UNTL. GR g/M/ff		DIMS.		WEIGHT (KG)		REF. TO ASSY.		DRG.		ITEM NO.		NO.OF ITEMS	
						—NA—						—NA—		—NA—	
TITLE EMERGENCY STOP VALVE BODY-BZ ND 250						CARD CODE		DRAWING NO. 1-301-01-10196				REV. 02			
						SHT. No 01				NO. OF SHT. 01					

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

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

DRG. NO. 1-301-01-10205

SH. 01 OF 10



FOR NOTES REFER "OUTER CASING CASTING ASSEMBLY" DRAWING.

(E) HNG K	50	63	64	71	80	0	32	40	64	96
-----------	----	----	----	----	----	---	----	----	----	----

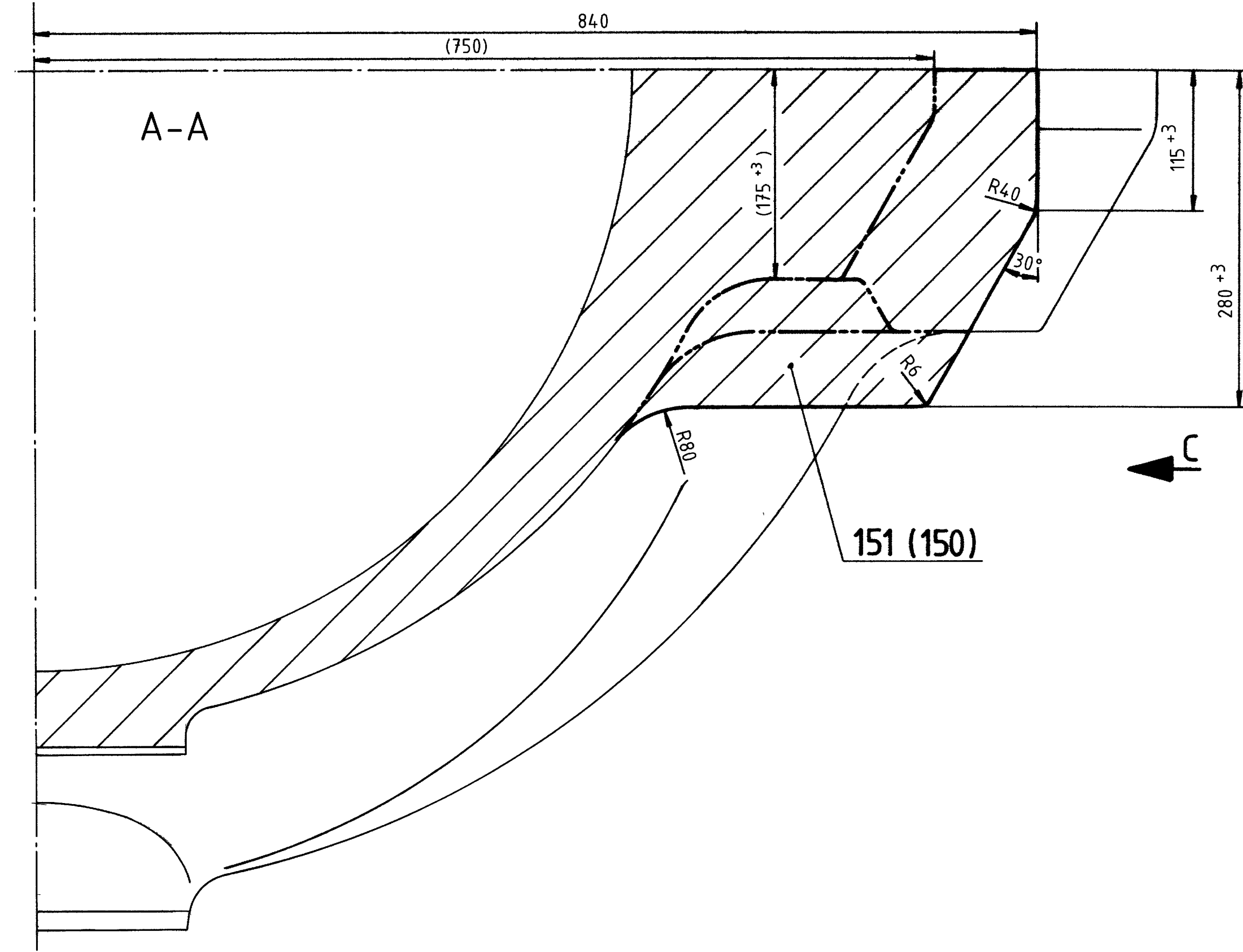
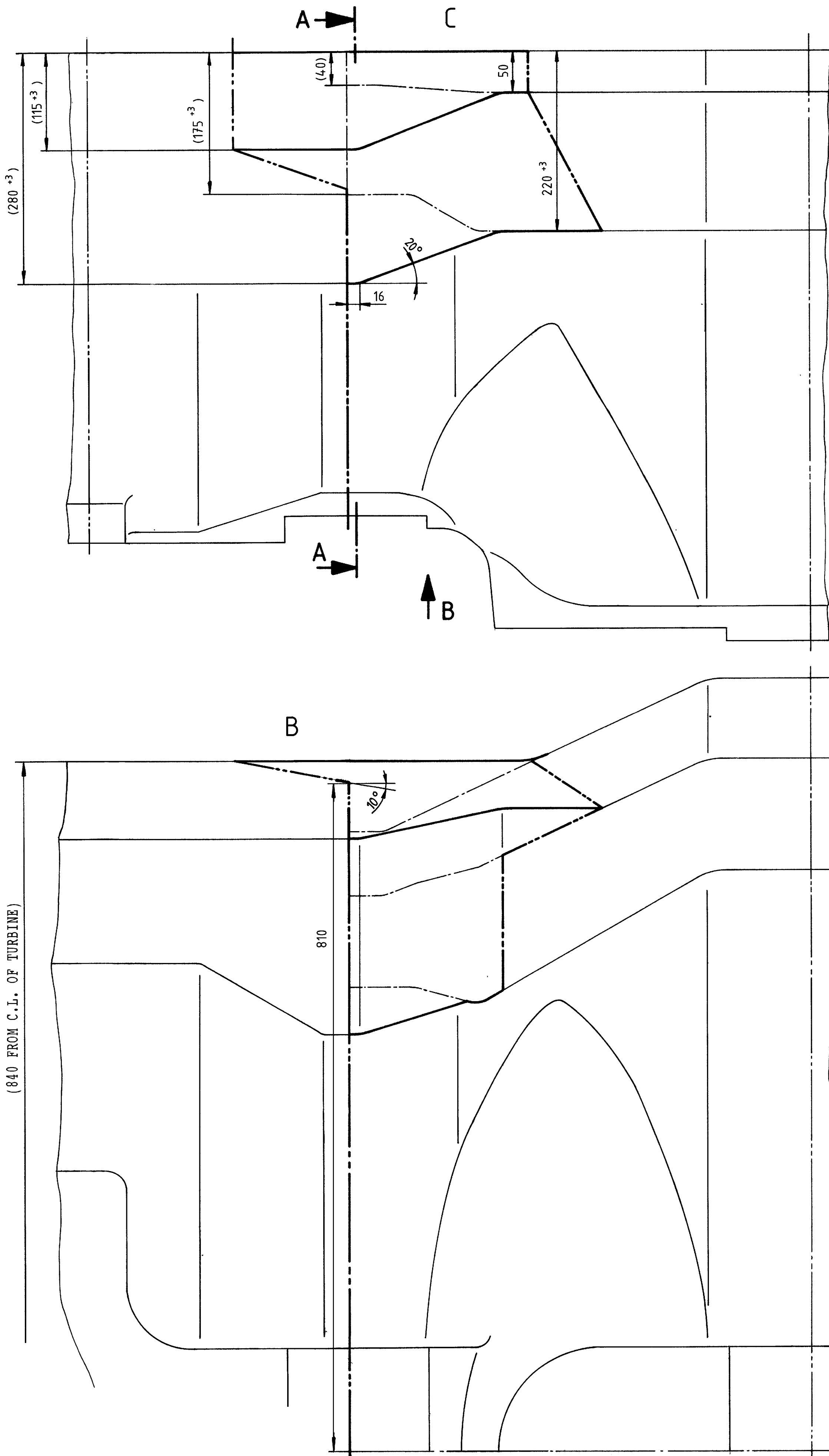
WEIGHT : Pos. 150 : 13,0 kg
Pos. 151 : 13,0 kg

150,151	00
VALID POS. NO.	VAR

TYPE OF PRODUCT OR				NAME OF CUSTOMER/PROJECT			
BHARAT HEAVY ELECTRICALS LIMITED				HYDERABAD			
DEPT	UNTOL DMS	SCALE	WEIGHT (KG)	REF TO ASSY DRG	ITEM NO	NO OF	
ITD	OR	NTS	NA	NA	NA	ITEMS	
CODE	Ø/M/f						
415							
TITLE				DRAWING NO.			
PARTING PLANE THICKENING OF UPPER				1-301-01-10205			
PART OF OUTER CASING CASTING				00			
				SHT No 01 NO OF SHT 01			

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

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

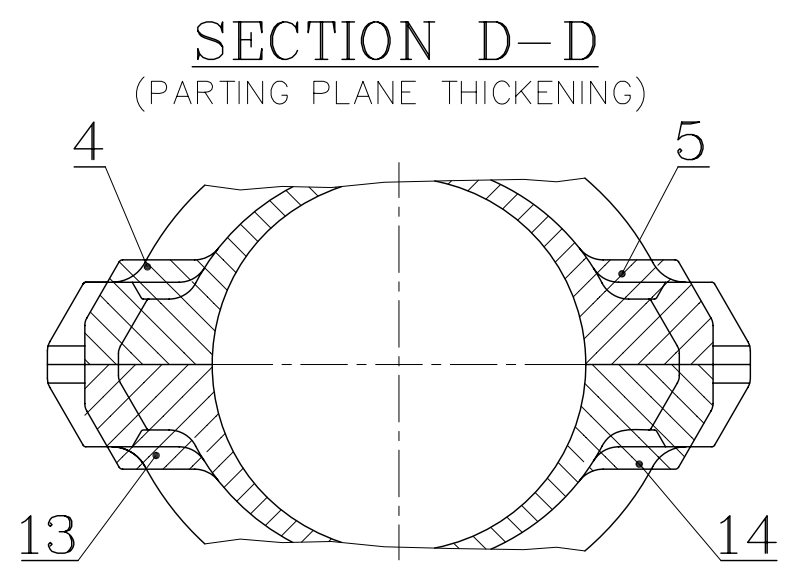


(E) HN^G 50
K 50
63 32
64 40
71 64
80 96

WEIGHT : Pos. 150 : 13,0 kg
Pos. 151 : 13,0 kg

150,151	00
VALID POS. NO.	VAR

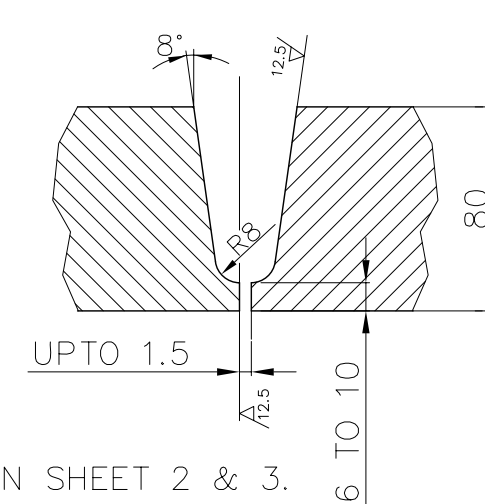
TYPE OF PRODUCT OR											
NAME OF CUSTOMER/PROJECT											
BHARAT HEAVY ELECTRICALS LIMITED				NAME	SIGN	DATE	NO OF				
HYDERABAD				DRN	MAHESH/SCS	20.08.02	VAR				
				CHD	MRB	20.08.02	NA				
				APPD	MRB	20.08.02					
DEPT	INTD	UNTO	DIMS	SCALE	WEIGHT (KG)	REF TO ASSY	DRG	ITEM NO	NO OF		
415		C/M/F		NTS	NA	NA		NA	ITEMS		
TITLE								CARD	DRAWING NO.	REV	
PARTING PLANE THICKENING OF LOWER								CODE	1-301-01-10206	00	
PART OF OUTER CASING CASTING								SHT No	01	NO OF	SHT 01



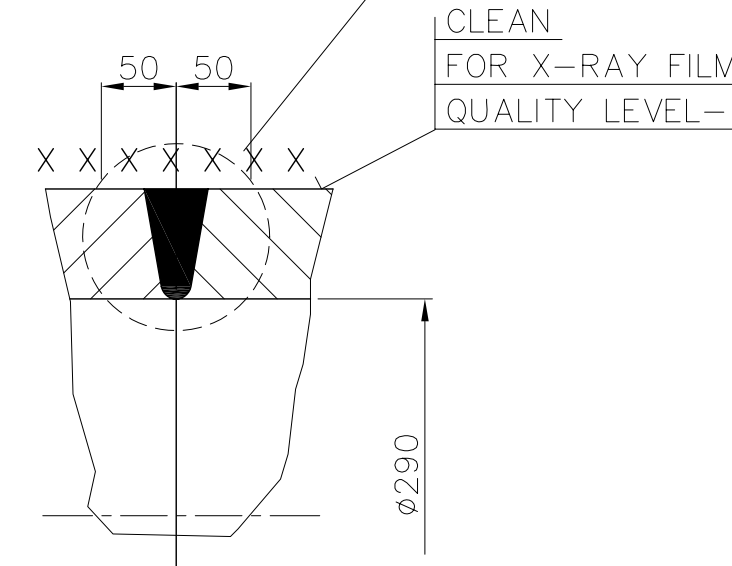
SECTION B-B



DETAIL-X
(N.T.S.)

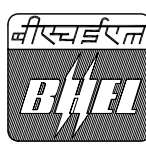
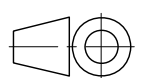


DETAIL—Y
(N.T.S.)



1. CASTING TO BE SUPPLIED AS PER PLANT PURCHASE SPECIFICATION NUMBER AS MENTIONED IN THE VARIANT TABLE.
 2. TWO INTEGRAL KEEL BLOCKS ARE TO BE PROVIDED ON EACH CASTING AT APPROPRIATE PLACES.
 3. THE CASTING SHOULD NOT CONTAIN ANY CHAPLETS AND CHILLS.
 4. WELDED ON CORE PRINTS TO BE MARKED WITH CENTRE PUNCH FOR IDENTIFICATION.
 5. MARKING AS PER PLANT PURCHASE SPECIFICATION TO BE MADE AT PLACES SHOWN THUS —.
 6. MARKINGS SHOWN THUS ————— REPRESENT PATTERN PARTITION.
 7. UNMENTIONED RADII 'R' AS PER INDIVIDUAL DRAWINGS.
 8. X-RAY TEST IS TO BE CARRIED OUT AT POS. MARKED THUS X X X X AND AT WELD ENDS AND WELD JOINTS.
 9. FOR RELEVANT DRAWINGS AND SUB-POSITIONS AGAINST THE VALID POS.NO'S MENTIONED IN THE VARIANT TABLE OF THIS DRAWING, REFER CORRESPONDING BILL OF MATERIALS AS GIVEN IN SHEET 2 & 3.
 10. POS.NO.3 (STOP VALVE BODY) IS TO BE WELDED TO POS.NO.1 (CASING FRONT PORTION UPPER PART) BY THE CASTING SUPPLIER.
 11. INSULATION SUPPORTS ARE TO BE WELDED ON THE OUTER SURFACE OF THE OUTER CASING BY THE CASTING SUPPLIER ACC. TO DRG.NO. 3-308-26-00001-00 REV 01.
- DETAIL**
(N.T.S.)

ALLOWABLE TOLERANCES ON DIMENSIONS ≤ 500 mm 5 ± 1
 > 500 mm 8 ± 2

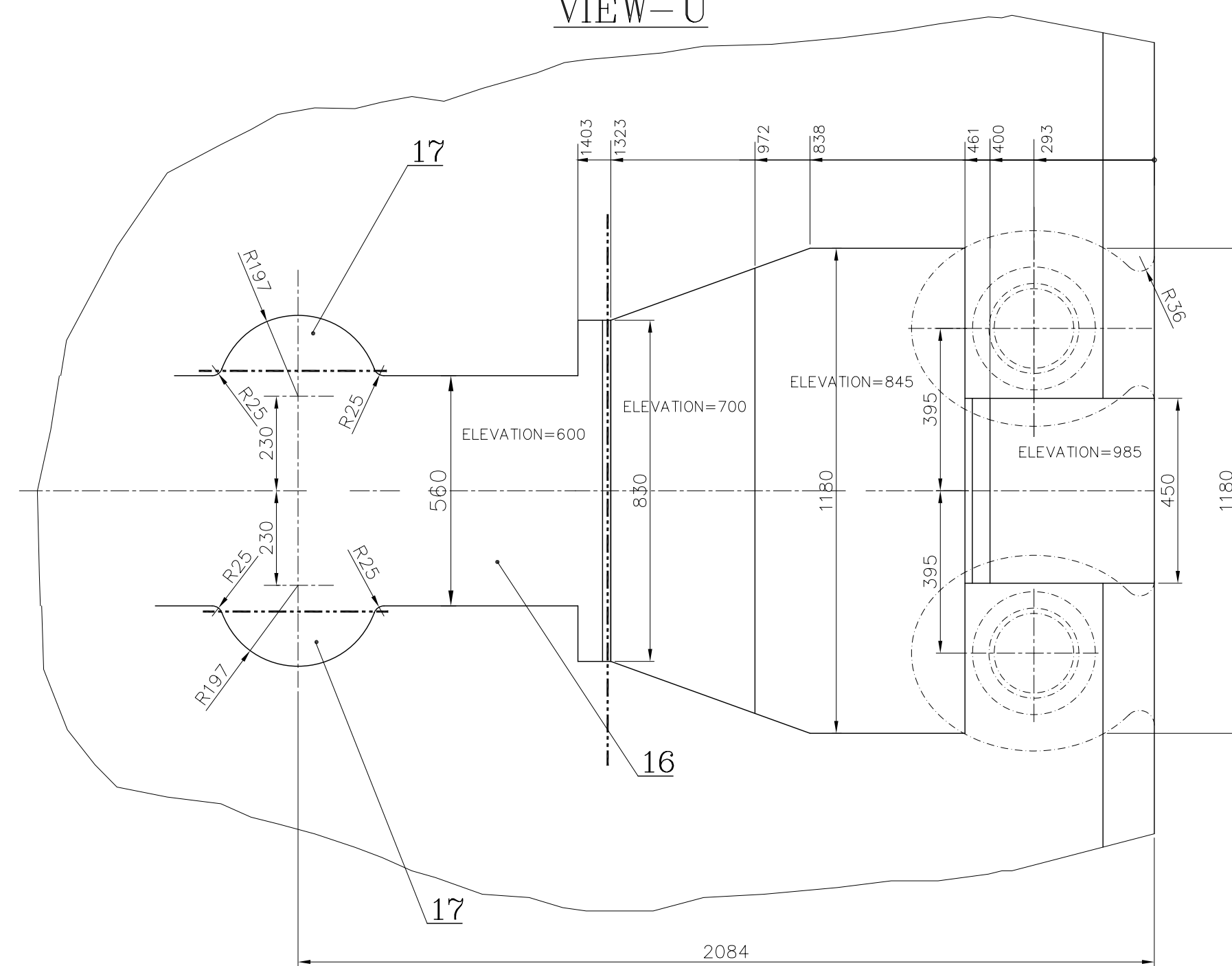
TC9217309303	11,12,13, 14,15	LOWER PART	G17CrMoV 5-10 HY19573	11217.00	01			
TC9217309290	1,2,3,4,5	UPPER PART	G17CrMoV 5-10 HY19573	14589.00	00			
MATERIAL CODE	POS.NO.	DESCRIPTION	MATERIAL STD. MATERIAL SPEC.	WEIGHT	VAR.			
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT								
भारत भारती  BHARAT HEAVY ELECTRICALS LTD. HYDERABAD								
DEPT. L.T.O. CODE 415			SCALE 1:10	WEIGHT (KG) NA	NAME	SIGN.	DATE	NO. OF VAR.
					DRN. RAJIV		15.07.04	
					CHD. RAJIV		15.07.04	-N.A.-
			APPD. C.N.V.R.		15.07.04			
					REF. TO ASSY. DRG. NA		ITEM NO. -N.A.-	NO. OF ITEMS -N.A.-
TITLE OUTER CASING CASTING (ASSEMBLY)		CARD CODE N.A.	DRAWING NO. 1-301-01-10220			REV. 01		
		SHT. No 01			NO. OF SHT. 03			

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT									
		BHARAT HEAVY ELECTRICALS LTD.			NAME		SIGN.	DATE	NO. OF VAR.
		HYDERABAD			DRN.	RAJIV		15.07.04	
					CHD.	RAJIV		15.07.04	NA
					APPD.	C.N.V.R.		15.07.04	
DEPT. I.T.D. DEPT. CODE 415	UNTO. DIMS. GR <i>GAH</i>		SCALE NTS	WEIGHT (KG) NA	REF. TO ASSY. DRG. -N.A.-		ITEM NO. -N.A.-	NO. OF ITEMS -N.A.-	
TITLE OUTER CASING CASTING					CARD CODE N.A.	DRAWING NO. 1-301-01-10220		REV. 01	
					SHT. No	2	NO. OF SHT.	3	

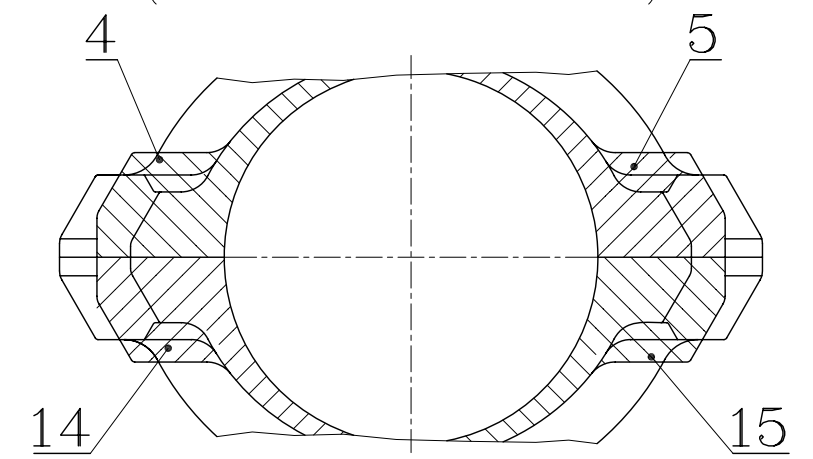
ALtered	REV.	DATE	ALTERED	REV.	DATE	ALtered	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	SMK
CHD / APPD			CHD / APPD			CHD / APPD			CHD / APPD			CHD / APPD			CHD / APPD			CHD / APPD			CHD / APPD	SMK
	ZONE			ZONE			ZONE			ZONE			ZONE			ZONE			ZONE			FOR POS 3 DRG NO WAS 23010110036-00 Rev00 WT. 1260 WAS 1137 Kg. WT. OF UP ASSEMBLY WAS 14466 Kg. SH 01 ALSO REV.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PRODUCT															
		BHARAT HEAVY ELECTRICALS LTD.				SIGN.		DATE		NO. OF VAR.					
		HYDERABAD				RAJIV		06.07.04							
						RAJIV		06.07.04		NA					
						C.N.V.R.		06.07.04							
DEPT. I.T.O.		UNTOOL. DIMS. GR.				SCALE		WEIGHT (KG)		REF. TO ASSY. DRG.		ITEM NO.		NO. OF ITEMS	
DEPT. CODE 415		S/M/F				NTS		NA		-N.A.-		-N.A.-		-N.A.-	
TITLE						DRAWING NO.						REV.			
OUTER CASING CASTING						1-301-01-10220						01			
						SHT. No		3		NO. OF SHT.		3			

ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	SMK
CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD	SMK
	ZONE			ZONE			ZONE			ZONE			ZONE			ZONE			
																			SHEET 01 & 02 REVISED



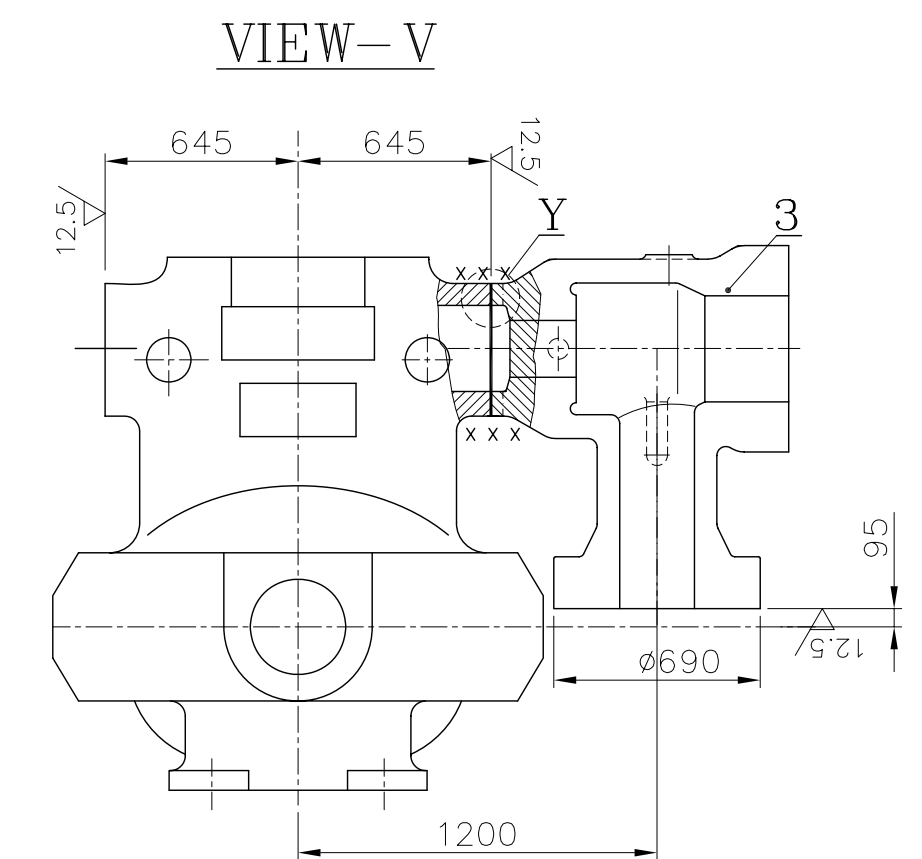
SECTION D-D
(PARTING PLANE THICKENING)



QUALITY LEVEL-1



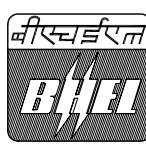
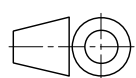
CLEAN
FOR X-RAY FILM
QUALITY LEVEL-1



STOP VALVE HOUSING SIZE ND 250

1. CASTING TO BE SUPPLIED AS PER PLANT PURCHASE SPECIFICATION NUMBER AS MENTIONED IN THE VARIANT TABLE.
2. TWO INTEGRAL KEEL BLOCKS TO BE PROVIDED ON EACH CASTING AT APPROPRIATE PLACES.
3. THE CASTING SHOULD NOT CONTAIN ANY CHAPLETS AND CHILLS.
4. WELDED ON CORE PRINTS TO BE MARKED WITH CENTRE PUNCH FOR IDENTIFICATION.
5. MARKING AS PER PLANT PURCHASE SPECIFICATION TO BE MADE AT PLACES SHOWN THUS ———
6. MARKINGS SHOWN THUS ———— REPRESENT PATTERN PARTITION.
4. UNMENTIONED RADII 'R' AS PER INDIVIDUAL DRAWINGS.
8. X-RAY TEST IS TO BE CARRIED OUT AT POS. MARKED THUS X X X X AND AT WELD ENDS AND WELD JOINTS.
9. FOR RELEVANT DRAWINGS AND SUB-POSITIONS AGAINST THE VALID POS.NO'S MENTIONED IN THE VARIANT TABLE OF THIS DRAWING, REFER CORRESPONDING BILL OF MATERIALS AS GIVEN IN SHEET 2 & 3.
10. POS.NO.3 (STOP VALVE BODY) IS TO BE WELDED TO POS.NO.1 (CASING FRONT PORTION UPPER PART) BY THE CASTING SUPPLIER.
11. INSULATION SUPPORTS ARE TO BE WELDED ON THE OUTER SURFACE OF THE OUTER CASING BY THE CASTING SUPPLIER ACC. TO DRG.NO. 3-308-26-00001-00 REV 01.

ALLOWABLE TOLERANCES ON DIMENSIONS ≤ 500 mm 5 ± 1
 > 500 mm 8 ± 2

TC9217309605	11,12,13,14,15,16,2x17	LOWER PART	G17CrMoV 510 HY19573	8935.00	01			
TC9217309591	1,2,3,4,5	UPPER PART	G17CrMoV 510 HY19573	12743.00	00			
MATERIAL CODE	POS.NO.	DESCRIPTION	MATERIAL STD. MATERIAL SPEC.	WEIGHT	VAR.			
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT			HNK 50/80-3					
BHARAT HEAVY ELECTRICALS LTD. HYDERABAD			NAME	SIGN.	DATE	NO.OF VAR.		
			DRN.	MAMTA	21.12.06	N.A. --		
			CHD.	GMM	21.12.06			
			APPD.	MRB	21.12.06			
DEPT. CODE	L.T.D. 415	UNTOL. DIMS. GR. E/M/f		SCALE 1:12.5	WEIGHT (KG) NA	REF. TO ASSY. DRG. NA	ITEM NO. - N.A. -	NO.OF ITEMS - N.A. -
TITLE OUTER CASING CASTING (ASSEMBLY)					CARD CODE N.A.	DRAWING NO. 1-301-01-10238		REV. 01
					SHT. No 01		NO.OF SHT. 03	

OUTER CASING CASTING-UPPER PART - BILL OF MATERIALS
(MATERIAL CODE: TC9217309591)

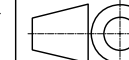
DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL	Wt (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS	SPECIFICATION		
1-301-01-10238-00 REV01 (3 SHEETS)			UPPER PART OF OUTER CASING CASTING	1,2,3,4,5		12743.00	
		1					
0-301-01-10559-03 REV02 (2 SHEETS)			FRONT UPPER PART OF OUTER CASING	1,2,5,6,12,13, 14,20,21,23, 26,27		6789.00	
1		1					
0-301-01-10559-03 REV02 (2 SHEETS)			FRONT UPPER SECTION H 50A		G17CrMoV510	3415.00	
1	1	1			HY 19573		
0-301-01-10559-03 REV02 (2 SHEETS)			VALVE CHAMBER H 50A		G17CrMoV510	1760.00	
1	2	1			HY 19573		
0-301-01-10559-03 REV02 (2 SHEETS)			RING		G17CrMoV510	37.00	
1	5	1			HY 19573		
0-301-01-10559-03 REV02 (2 SHEETS)			RING		G17CrMoV510	95.00	
1	6	1			HY 19573		
0-301-01-10559-03 REV02 (2 SHEETS)			SUPPORT PAW		G17CrMoV510	220.00	
1	12	1			HY 19573		

DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL	Wt (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS	SPECIFICATION		
0-301-01-10559-03 REV02 (2 SHEETS)			SUPPORT PAW		G17CrMoV510	220.00	
1	13	1			HY 19573		
0-301-01-10559-03 REV02 (2 SHEETS)			LUG		G17CrMoV510	20.00	
1	14	1			HY 19573		
0-301-01-10559-03 REV02 (2 SHEETS)			CYLINDRICAL PORTION H 50A		G17CrMoV510	320.00	
1	20	1			HY 19573		
0-301-01-10559-03 REV02 (2 SHEETS)			REDUCER RART 50A		G17CrMoV510	662.00	
1	21	1			HY 19573		
0-301-01-10559-03 REV02 (2 SHEETS)			CIRCUMFERENCIAL LUG		G17CrMoV510	36.00	
1	23	1			HY 19573		
0-301-01-10559-03 REV02 (2 SHEETS)			SUPPORT LUG		G17CrMoV510	2.00	
1	26	1			HY 19573		
0-301-01-10559-03 REV02 (2 SHEETS)			SUPPORT LUG		G17CrMoV510	2.00	
1	27	1			HY 19573		

DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL	Wt (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS	SPECIFICATION		
0-301-01-10607-00 REV01 2 SHEETS.			OUTER CASING REAR UPPER PART	1,2,4,7,9,12,13, 23,24,25, 28 TO 33.		4668	
2		1					
0-301-01-10607-00 REV01 2 SHEETS.			FLANGE PORTION		G17CrMoV510	1145	
2	1	1			HY 19573		
0-301-01-10607-00 REV01 2 SHEETS.			PAD		G17CrMoV510	440	
2	2	1			HY 19573		
0-301-01-10607-00 REV01 2 SHEETS.			HALF TRANSITION PORTION		G17CrMoV510	480	
2	4	1			HY 19573		
0-301-01-10607-00 REV01 2 SHEETS.			CYLINDRICAL PORTION		G17CrMoV510	445	
2	7	1			HY 19573		

DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL	Wt (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS	SPECIFICATION		
0-301-01-10607-00 REV01 2 SHEETS.			LOCATING WEB		G17CrMoV510	72	
2	9	1			HY 19573		
0-301-01-10607-00 REV01 2 SHEETS.			TRANSITION PORTION		G17CrMoV510	1770	
2	12	1			HY 19573		
0-301-01-10607-00 REV01 2 SHEETS.			PAD		G17CrMoV510	200	
2	13	1			HY 19573		
0-301-01-10607-00 REV01 2 SHEETS.			LUG		G17CrMoV510	44	
2	23	2			HY 19573		
0-301-01-10607-00 REV01 2 SHEETS.			SUPPORT LUG		G17CrMoV510	7	
2	24	1			HY 19573		
0-301-01-10607-00 REV01 2 SHEETS.			SUPPORT LUG		G17CrMoV510	7	
2	25	1			HY 19573		

[illegible]

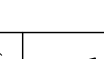
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT										HNK 50/80-3					
 BHARAT HEAVY ELECTRICALS LTD. HYDERABAD				NAME		SIGN.		DATE		NO. OF					
				DRN.				21.12.06		VAR.					
				CHD.		GMM		21.12.06		NA					
				APPD.				21.12.06							
DEPT. T.O.		UNTO. DIMS. GR.				SCALE		WEIGHT (KG)		REF. TO ASSY. DRG.		ITEM NO.		NO. OF	
DEPT. CODE 415		G/M/F				NTS		NA		-N.A.-		-N.A.-		-N.A.-	
TITLE								DRAWING NO.				REV.			
OUTER CASING CASTING								1-301-01-10238				01			
CARD CODE								SHT. No				NO. OF SHT.			
N.A.								2				3			

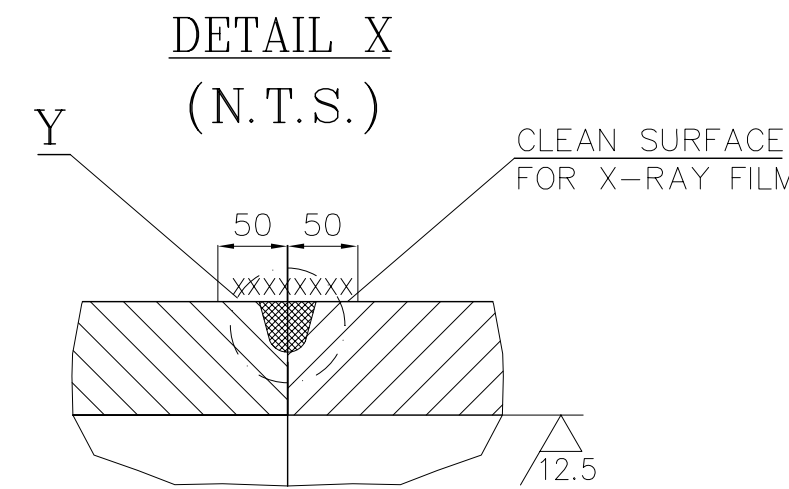
DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL	WT (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS	SPECIFICATION		
0-301-01-10607-01 REV01 2 SHEETS.			HALF- TRANSITION PORTION		G17CrMoV510	480	
13	4	1			HY 19573		
0-301-01-10607-01 REV01 2 SHEETS.			CYLINDRICAL PORTION		G17CrMoV510	445	
13	7	1			HY 19573		
0-301-01-10607-01 REV01 2 SHEETS.			PAD		G17CrMoV510	67	
13	8	1			HY 19573		
0-301-01-10607-01 REV01 2 SHEETS.			LOCATING WEB		G17CrMoV510	72	
13	9	1			HY 19573		
0-301-01-10607-01 REV01 2 SHEETS.			PAD		G17CrMoV510	470	
13	10	1			HY 19573		

[illegible]

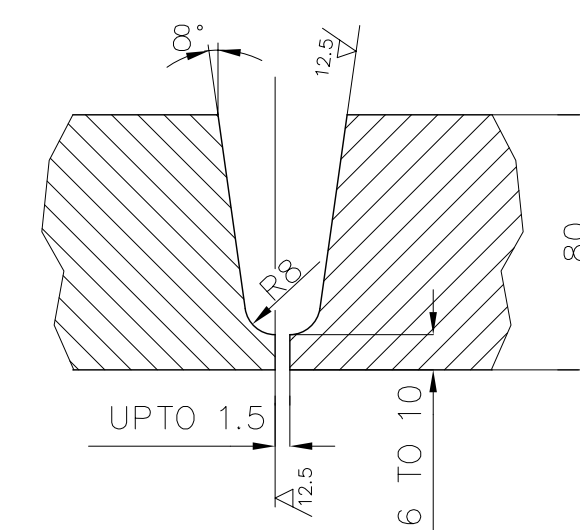
GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

INVENTORY NO[illegible]

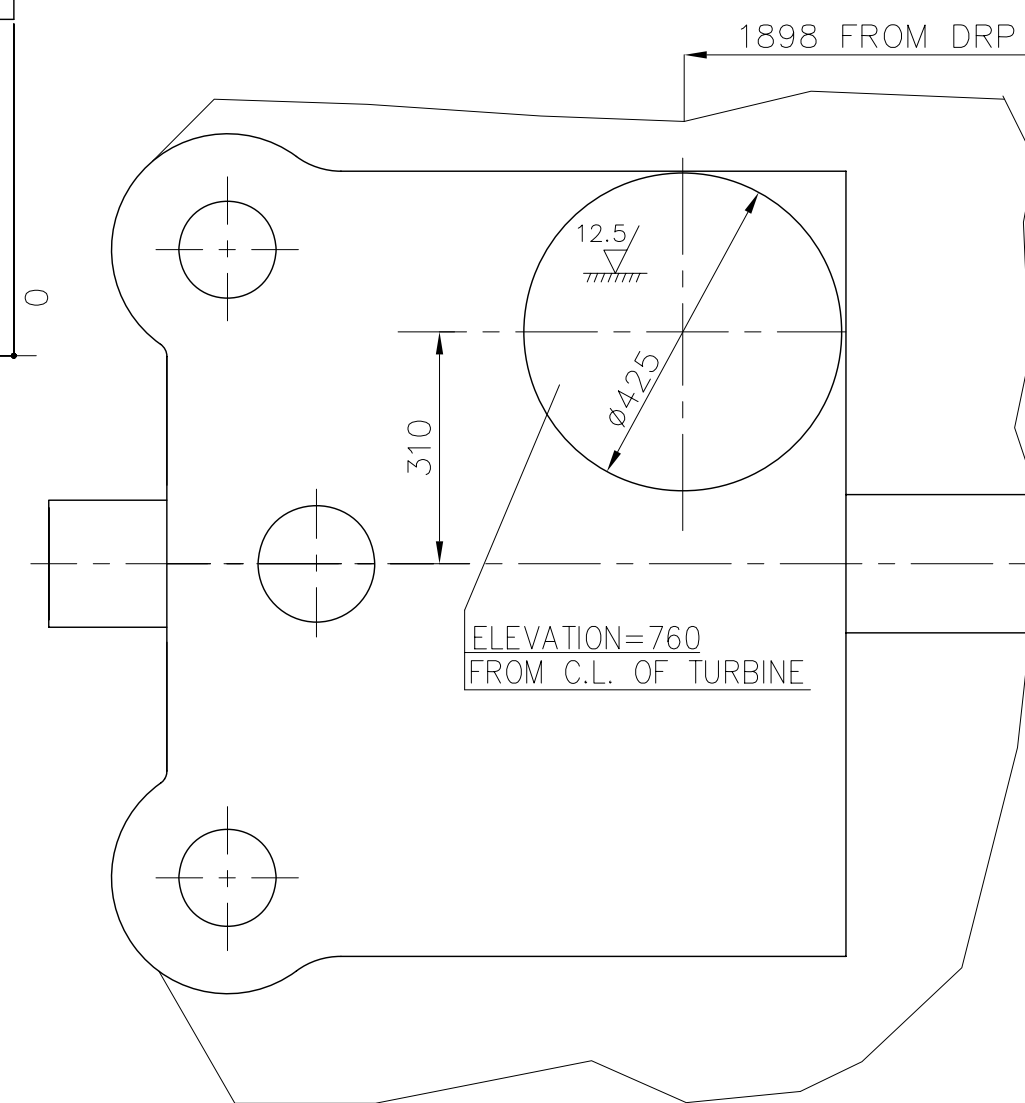
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT					HNK 50/80-3				
 BHARAT HEAVY ELECTRICALS LTD. HYDERABAD						NAME	SIGN.	DATE	NO. OF VAR.
					DRN.	MAMTA		21.12.06	NA
					CHD.	GMM		21.12.06	
					APPD	MRB		21.12.06	
DEPT. L.T.D. DEPT. CODE 415	UNTL. DIMS. OR S/M/F		SCALE NTS	WEIGHT (KG) NA	REF. TO ASSY. DRG. -N.A.-			ITEM NO. OF ITEMS -N.A.-	
TITLE OUTER CASING CASTING					CARD CODE N.A.	DRAWING NO. 1-301-01-10238			REV. 01



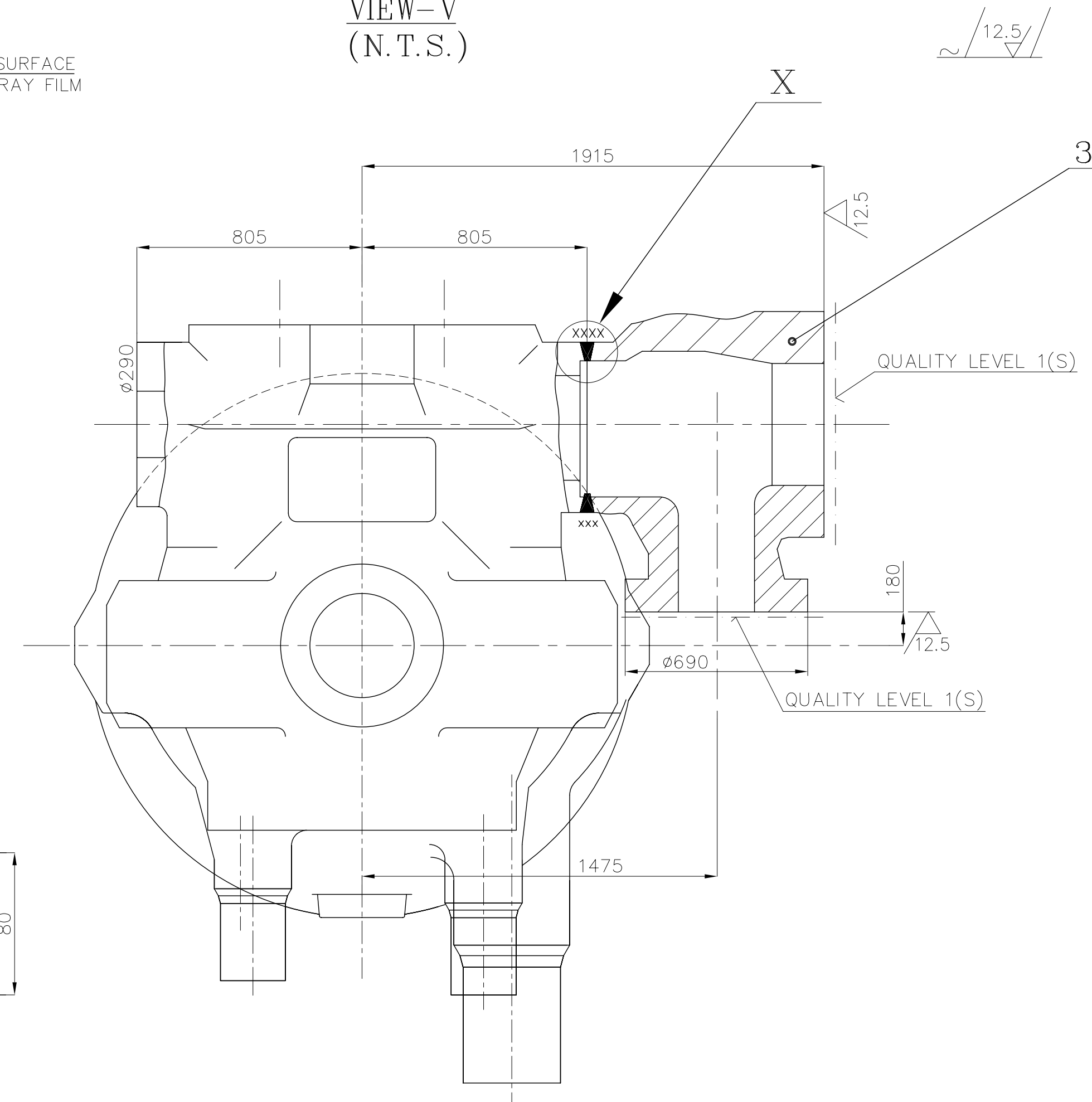
DETAIL-Y
(N.T.S.)



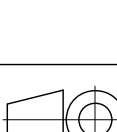
VIEW-U
(N.T.S.)



VIEW-V
(N.T.S.)



1. CASTING IS TO BE SUPPLIED AS PER PLANT PURCHASE SPECIFICATION NUMBER AS MENTIONED IN THE VARIANT TABLE.
2. TWO INTEGRAL KEEL BLOCKS ARE TO BE PROVIDED ON EACH CASTING AT APPROPRIATE PLACES.
3. THE CASTING SHOULD NOT CONTAIN ANY CHAPLETS AND CHILLS.
4. WELDED ON CORE PRINTS TO BE MARKED WITH CENTRE PUNCH FOR IDENTIFICATION.
5. MARKING AS PER PLANT PURCHASE SPECIFICATION TO BE MADE AS PER MODULE DRAWINGS.
6. MARKINGS SHOWN THUS _____ REPRESENT PATTERN PARTITION
7. UNMENTIONED RADII 'R' AS PER INDIVIDUAL DRAWINGS.
8. POS. NO. 3 (STOP VALVE BODY) IS TO BE WELDED TO THE POS. NO.1 (CASING FRONT PORTION UPPER PART) BY THE CASTING SUPPLIER.
9. X-RAY TEST IS TO BE CARRIED OUT AT POSITION MARKED THUS X X X X AND AT WELD ENDS AND WELD JOINTS.
10. FOR WELD ON END OF EXTRACTION BRANCH THE QUALITY LEVEL IS 1(S)
11. FOR RELEVANT DRAWINGS AND SUB-POSITIONS AGAINST THE VALID POS. NO'S. MENTIONED IN THE VARIANT TABLE OF THIS DRAWING, REFER CORRESPONDING BILL OF MATERIAL AS GIVEN IN SHEET 2.
12. TOLERANCE ON DIMENSIONS:
UP TO 500 3±1
OVER 500 4±2
13. INSULATION SUPPORTS ARE TO BE WELDED ON THE OUTER SURFACE OF THE OUTER CASING BY THE CASTING SUPPLIER ACC. TO DRG.NO.3-308-26-00001-00

TC9217309567		OUTER CASING LOWER PART (BZ)	4,5,6	G17CrMoV5-10 HY19573	12380	01
TC9217309559		OUTER CASING UPPER PART (BZ)	1,2,3	G17CrMoV5-10 HY19573	14460	00
MATERIAL CODE		DESCRIPTION	POS NOS	MATERIAL STD.	WEIGHT (Kg)	VAR. NO.
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT						
 BHARAT HEAVY ELECTRICALS LTD. HYDERABAD						
DRN.		NAME		SIGN.	DATE	NO. OF VAR.
GMM					24.01.07	
CHD.		ASHOK			24.01.07	-N-A-
APPD.		MRB			24.01.07	
OK VR	DEPT. L.T.D. CAD 415	UNTOL. DIMS. GR. C/M/F		SCALE 1:8	WEIGHT (KG)	REF. TO ASSY. DRG. -N-A-
					ITEM NO.	NO. OF ITEMS -N-A-
					-N-A-	
TITLE OUTER CASING CASTING ASSEMBLY				CARD CODE N.A.	DRAWING NO. 1-301-01-10242 REV. 01	
				SHT. No	1	NO. OF SHT. 2

INVENTORY NO

SIGN. AND DATE

REF. DRG. NO.

COMPUTER FILE NAME

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

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FIRST ANGLE PROJECTION

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DRG. NO. 1-30101-10242

SH. 2 OF 2

OUTER CASING UPPER PART – BILL OF MATERIALS

(MATERIAL CODE: TC9217309559)

DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL SPECIFICATION	Wt (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS			
1-301-01-10242-00 REV:01			UPPER PART OF OUTER CASING	1,2,3	G17CrMoV5-10	14460.00	
		1			HY 19573		
0-301-01-10580-00 REV01			OUTER CASING FRONT UPPER PART	1,2,3,6,7,10	G17CrMoV5-10	5919	
1		1			HY 19573		
0-301-01-10580-00 REV01			FRONT PORTION		G17CrMoV5-10	5750	
1	1	1			HY 19573		
0-301-01-10580-00 REV01			RING		G17CrMoV5-10	95	
1	2	1			HY 19573		
0-301-01-10580-00 REV01			RING		G17CrMoV5-10	37	
1	3	1			HY 19573		
0-301-01-10580-00 REV01			HOLDING LUG		G17CrMoV5-10	5	
1	6	1			HY 19573		
0-301-01-10580-00 REV01			HOLDING LUG		G17CrMoV5-10	5	
1	7	1			HY 19573		

DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL SPECIFICATION	Wt (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS			
0-301-01-10580-00 REV01			LUG		G17CrMoV5-10	27	
1	10	1			HY 19573		
0-301-01-10611-00 REV00			OUTER CASING REAR UPPER PART	1,8	G17CrMoV5-10	7194.75	
2		1			HY 19573		
0-301-01-10611-00 REV00			OUTER CASING REAR UPPER PART		G17CrMoV5-10	7130	
2	1	1			HY 19573		
0-301-01-10611-00 REV00			BOSS		G17CrMoV5-10	64.75	
2	8	1			HY 19573		
1-301-01-10196-04 REV02			EMERGENCY STOP VALVE BODY	1,2,3	G17CrMoV5-10	1346.25	
3		1			HY 19573		
1-301-01-10196-04 REV02			STOP VALVE BODY		G17CrMoV5-10	1230	
3	1	1			HY 19573		
1-301-01-10196-04 REV02			EXTENSION PIECE		G17CrMoV5-10	30	
3	2	1			HY 19573		

DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL SPECIFICATION	Wt (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS			
1-301-01-10196-04 REV02			EXTENSION PIECE		G17CrMoV5-10	86.25	
3	3	1			HY 19573		
3-308-26-00001-00 REV01			WELDED INSULATION SUPPORTS ON HOT TURBINE				
		1					

DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL SPECIFICATION	Wt (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS			

OUTER CASING LOWER PART – BILL OF MATERIALS

(MATERIAL CODE: TC9217309567)

DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL SPECIFICATION	Wt (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS			
1-301-01-10242-01 REV:01			LOWER PART OF OUTER CASING	4,5,6	G17CrMoV5-10	12380	
		1			HY 19573		
0-301-01-10581-00 REV00			OUTER CASING FRONT LOWER PART	1,2,3	G17CrMoV5-10	4341	
4		1			HY 19573		
0-301-01-10581-00 REV00			FRONT PORTION LOWER PART		G17CrMoV5-10	4335	
4	1	1			HY 19573		
0-301-01-10581-00 REV00			LUG		G17CrMoV5-10	3	
4	2	1			HY 19573		
0-301-01-10581-00 REV00			LUG		G17CrMoV5-10	3	
4	3	1			HY 19573		
0-301-01-10611-01 REV00			OUTER CASING REAR PORTION LOWER PART	2,4,5,6,7,9 10,2X11,12	G17CrMoV5-10	7972	
5		1			HY 19573		
0-301-01-10611-01 REV00			REAR PORTION		G17CrMoV5-10	7130	
5	2	1			HY 19573		
0-301-01-10611-01 REV00			SEAT		G17CrMoV5-10	100	
5	4	1			HY 19573		

DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL SPECIFICATION	Wt (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS			
0-301-01-10611-01 REV00			PAD		G17CrMoV5-10	192	
5	5	1			HY 19573		
0-301-01-10611-01 REV00			BOSS		G17CrMoV5-10	100	
5	6	1			HY 19573		
0-301-01-10611-01 REV00			PIPE Ø355X23.83 X400		13CrMo44	36	
5	7	1					
0-301-01-10611-01 REV00			BOSS		G17CrMoV5-10	20	
5	9	1			HY 19573		
0-301-01-10611-01 REV00			BOSS		G17CrMoV5-10	200	
5	10	1			HY 19573		
0-301-01-10611-01 REV00			PIPE Ø273.1X12.7 X300		13CrMo44	22	
5	11	2					
0-301-01-10611-01 REV00			BOSS		G17CrMoV5-10	150	
5	12	1			HY 19573		
1-301-01-10242-00 REV00			BOSS FOR EXTRACTION		G17CrMoV5-10	67	
6		1			HY 19573		

DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL SPECIFICATION	Wt (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS			
3-308-26-00001-00 REV01			WELDED INSULATION SUPPORTS ON HOT TURBINE				
		1					

DRAWING NO. REV.			DESCRIPTION	VALID POSITIONS	MATERIAL SPECIFICATION	Wt (Kg) PER PIECE	REMARKS
POSITION	SUB POSITION	NUMBER OF PIECES		SUB POSITIONS			

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

ASHOK

CNVR

REVISION MADE IN SHEET 1.

DEPT. I.T.D. DEPT. CODE 415

UNTOL. DIMS. GR. 0.1/0.15

SCALE N.T.S

WEIGHT (KG) -N.A-

REF. TO ASSY. DRG. -N.A-

ITEM NO. -N.A-

NO. OF ITEMS -N.A-

CARD CODE N.A.

DRAWING NO. 1-301-01-10242

REV. 01

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DRG. NO. 3-308-26-00001

SH. 01 OF 01

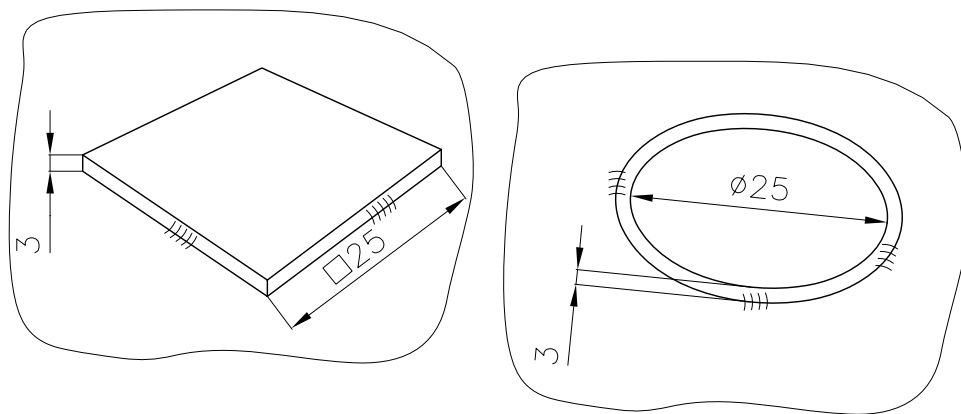


FIG-1

TO THE FOUR OPPOSITE SIDES TACKWELD 2MM.FILLET CLASS II WELD
DIN 1912

VALVE BLOCK

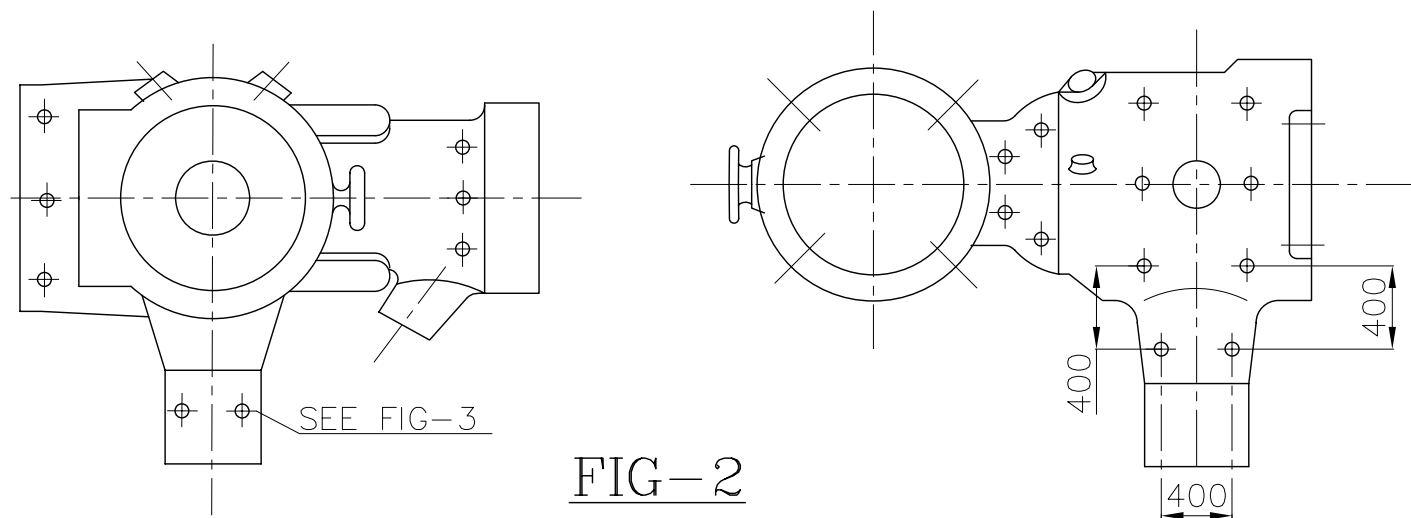
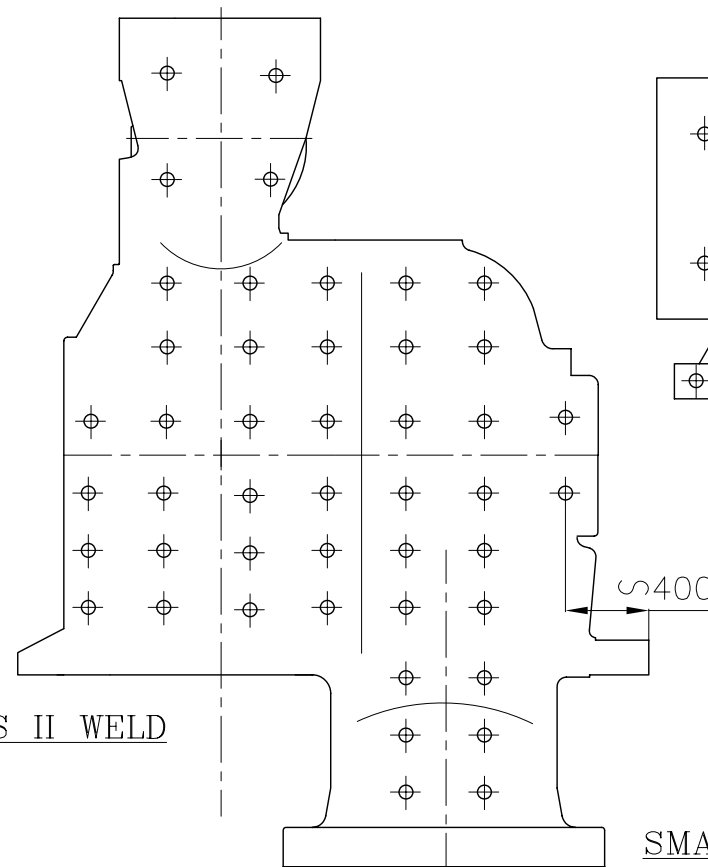


FIG-2

SMALL PLATES ARE WELDED OVER THE ENTIRE CASTING SURFACE
DISTANCE BETWEEN SMALL PLATES APPROX. 400 MM.



TURBINE OUTER CASING

FIG-3

SMALL PLATES ARE WELDED OVER THE ENTIRE
CASTING SURFACE DISTANCE BETWEEN SMALL PLATES
APPROX. 400 MM.

NOTES:

1. EITHER SQUARE ARE ROUND PLATE MAY BE WELDED TO THE TURBINE CASING BY CASTING SUPPLIER AS SHOWN IN FIG-1 BEFORE THE FINAL HEAT TREATMENT.
2. WHEN INSULATING THE TURBINE PARTS, NUTS OR SUPPORT WIRES WILL BE WELDED TO THESE PLATES AS REQD. WITHOUT NECESSITY OF FURTHER HEAT TREATMENT.

TYPE OF PRODUCT OR
NAME OF CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

NAME	SIGN.	DATE	NO.OF VAR.
DRN. PRAVEEN		20.03.83	
CHD. D.S.RAO		20.03.83	-NA-
APPD. M.R.BABU		20.03.83	

DEPT. I.T.D.	UNTOL. DIMS. GR. C/M/F	SCALE NTS	WEIGHT (KG) -NA-	REF. TO ASSY. DRG. -NA-	ITEM NO. -NA-	NO.OF ITEMS -NA-
CODE 415						

TITLE	CARD CODE -NA-	DRAWING NO. 3-308-26-00001	REV. 01
WELDED INSULATION SUPPORT ON HOT TURBINE			

SHT. No 01 NO. OF SHT. 01

INVENTORY NO. SIGN. AND DATE REF. DRG. NO. COMPUTER FILE NAME 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

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261