

**SPECIFICATION FOR**  
**SPHEROIDAL GRAPHITE CAST IRON**  
**COMPONENTS OF 3-PHASE**  
**TRACTION MOTOR TYPE 6FRA-6068 & 6FXA-7059**  
**OF ELECTRIC LOCOMOTIVES**

**Specification No. 4TMS.096.068, Rev-2**

TRACTION MOTOR DEPARTMENT  
 CHITTARANJAN LOCOMOTIVE WORKS  
 CHITTARANJAN – 713365  
 WEST BENGAL

Approved By

**RAJIV KUMAR  
BARNWAL**

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 o=CHITTARANJAN LOCOMOTIVE WORKS, cn=RAJIV KUMAR  
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**AMENDMENT SHEET**

ALT. No.	AUTHORITY	DESCRIPTION	SIGNATURE	DATE

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**TECHNICAL SPECIFICATION OF**  
**END FRAME (DE), END FRAME (NDE), ROTOR END RING (MODIFIED),**  
**SET OF LABYRINTHS AND SPEED PROBE HOUSING MADE FROM**  
**SPHEROIDAL GRAPHITE CAST IRON (SGCI) FOR USE ON**  
**THREE PHASE TRACTION MOTORS TYPE 6FRA-6068 & 6FXA-7059**

**1.0. SCOPE:**

1.1 This specification covers the technical requirements, manufacture, inspection and packing of End Frame (DE), End Frame (NDE), Rotor End Ring (Modified), Set of labyrinths and Speed Probe Housing made from Spheroidal Graphite Cast Iron (SGCI) for use on Three Phase Traction Motors type 6FRA-6068 & 6FXA-7059.

**2.0. MATERIAL SPECIFICATION AND DRAWING OF COMPONENTS:**

2.1 The castings shall conform to Gr. 400/18 of IS: 1865 (Latest version) in regards to chemical composition, physical properties and other relevant aspects.

The details of castings/items covered in this specification are given below:

SN	Description	CLW Drg. No.	ABB Drg. No.
<b>COMPONENTS FOR 6FRA-6068</b>			
1	END FRAME/DE	1TWD.096.005	3EHM 112008
2	END FRAME/NDE	0TWD.096.003	3EHM 030965
3(i)	ROTOR END RING	2TWD.096.100	3EJD0000001057
3(ii)	END RING PLATE FOR SCHEME-I ROTOR	SKEL 4739	-
3(iii)	ROTOR END RING FOR SCHEME-II ROTOR	SKEL 4732	-
4	SPEED PROBE HOUSING	1TWD.096.077	3EHM 111880
5	OUTER BEARING CAP/DE	1TWD.096.006	3EHM 112045
6	CLAMP PLATE/NDE	2TWD.096.033	3EHM 211622
7	BEARING CAP/NDE	3TWD.096.032	3EHM 311758
8	INNER LABYRINTH/DE	4TWD.096.028	3EHM 413061
9	INNER LABYRINTH/NDE	4TWD.096.031	3EHM 412822
10	INNER LABYRINTH/NDE	4TWD.096.042	3EHM 412821
11	INNER LABYRINTH/DE	4TWD.096.043	3EHM 413072
12	OUTER LABYRINTH/DE	4TWD.096.029	3EHM 413071
<b>COMPONENTS FOR 6FXA-7059</b>			
13	END FRAME/DE	1TWD.097.011	3EHM 111956
14	END FRAME/NDE	0TWD.097.012	3EHM 030957
15	CLAMP PLATE/NDE	2TWD.097.040	HMMT 211395
16	BEARING CAP/NDE	3TWD.097.039	HMMT 311492
17	BEARING COVER/DE	3TWD.097.036	3EHM 413033
18	INNER LABYRINTH/NDE	4TWD.097.034	HMMT 412270
19	INNER LABYRINTH/NDE	4TWD.097.038	HMMT 412371
20	INNER LABYRINTH/DE	4TWD.097.037	3EHM 413036
21	INNER LABYRINTH/DE	4TWD.097.035	3EHM 413034
22	ROTOR END RING (MODIFIED)	2TWD.097.013	3EHM 211728

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**3.0. MANUFACTURING:**

- 3.1 The choice of manufacturing method are left to the manufacturer provided physical/chemical properties of specified grade nominated on the drawing are obtained. However, all the components should be machined on CNC Machine and the manufacturer should fulfil schedule of Technical requirements as per RDSO's STR No. RDSO/2007/EL/STR/0021, Rev-1 or Latest.
- 3.2 The dimension indicated on the relevant drawing are for the finish-machined components. The working drawing of the pattern and the pattern shall be prepared by the manufacturer/tenderer himself. Responsibilities for pattern design shall be with the manufacturer/supplier completely.
- 3.3 Machining variations in the linear and angular dimensions without tolerance indications shall be in accordance with IS: 2102 (part-I).
- 3.4 The surface of the castings shall be free of mould and core sand and any unevenness impairing the usability of the castings.
- 3.5 The castings shall not exhibit any defects which will impair their machinability or usefulness to more than insignificant extent.
- 3.6 Welding shall not be allowed for repair of castings.
- 3.7 In the event of castings proving defective from foundry in the course of preparation, machining or assembly, such castings may be rejected notwithstanding any previous certification or satisfactory testing and/or inspection.

**4.0. INSPECTION:**

- 4.1 Prototype inspection:- The successful tenderer shall offer a minimum of two m/sets of Components under procurement for Prototype Inspection/Testing to the Dy.CEE/TMD/CLW/CRJ before undertaking bulk production supply, for the first time.
- 4.2 The inspection shall be carried out as per Gr. 400/18 of IS: 1865.
- 4.3 The Inspection shall be carried out in two stages:
- Metallurgical Inspection of casting by CC&M/CLW/CRJ or as per stipulation in P.O.
  - Dimensional inspection of finish machined components as per P.O. stipulation.
- 4.4 Any shortcoming/defects in the design and workmanship of the castings shall be pointed out to the supplier after Prototype Inspection tests to enable him to incorporate necessary improvement before bulk supply is commenced.
- 4.5 Routine inspection of the items shall be carried out as per Para 4.2 and 4.3 above only after the approval of prototype sample by the authorised representative.
- 4.6 The manufacturer shall provide all the necessary facilities at their Works/Premises for Prototype as well as Routine inspection.
- 4.7 The inspection authority of purchaser shall have free access to the Works of the manufacturer at all times during manufacture. He shall be free to inspect the manufacture at any stage, to reject any material which do not confirm the terms of specification.
- 4.8 To ensure the accuracy and precision in the supplies of machined items procured in kit form, measurement of dimensions of 100% material per lot with proper traceability during firm's internal inspection (records to be shown to CLW's inspection wing) & 20% material per lot during routine inspection in presence of CLW's inspector against P.O. quantity must be done by three dimensional Co-Ordinate Measuring Machine.

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**5.0. NON-DESTRUCTIVE TEST:**

5.1 Castings shall be subjected to radiographic or other method of Non-destructive inspection (5% offered qty. selected at random).

**5.2 Radiographic Test shall be done as per ASTM E689-95.**

Radiograph shall be graded in accordance with ASTM E-446 and ASTM E-186 as per TABLE-1.

TABLE-1	
Shrinkage	3
Inclusion	3
Gas Porosity	3
Crack	Not Allowed
Hot Tears	Not Allowed
Chaplets	Not Allowed

The casting having defects exceeding the above radiographic quality limits shall not be accepted.

5.3 The sampling of castings shall be in accordance with clause of relevant specification nominated on the relevant drawing.

5.4 Sample of the castings shall be inspected by the authorised representative of purchaser for its physical property test.

5.5 In case the radiographic test is not possible due to special shape or contour of the casting, it may be subjected to other Non-destructive test.

**6.0. STATIC BALANCING:**

6.1 Only Rotor End Ring required to be checked for 100% static unbalance. The permissible unbalance in fully machined condition shall be limited to 20±5 gram (max).

**7.0. DOCUMENTS TO BE SUPPLIED:**

7.1 The tenderer shall furnish following information along with their offer:

a) Facilities available for casting and machining as per RDSO's STR No. RDSO/2007/EL/STR/0021, Rev-1 or Latest and testing of castings including Non-destructive testing etc.

7.2 The manufacturer shall produce the records of all tests carried out by them along with tested sample to the inspecting authority at the time of inspection.

7.3 Certificate of physical property test of individual components shall be supplied by the manufacturer along with each supply.

**8.0. MARKING:**

8.1 Each cast component should have individual distinct number embossed by the foundry in format 'FFF/YY/XXXX/CCC' (where, 'FFF' is trademark or initial of foundry, 'YY' is year of casting, 'XXXX' is unique four digit Batch/Heat No. & 'CCC' is customer code for the foundry).

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8.2 Each finish/machined component shall be legibly and indelibly marked/etched/punched properly mentioning the following, not necessarily in same order:

- a) Manufacturer's initial or trademark.
- b) Manufacturer's Unique Serial Number in format 'XX/MMYY/ZZZZZ' (where, 'XX' is code unique to a vendor to be obtained from Dy.CEE/TMD's Office, 'MMYY' is month & year of manufacture of subject item and 'ZZZZZ' is unique & incremental five digit serial number from 00001 to 99999 specific to a vendor irrespective of P.O. No. or P.O. placing authority).
- c) Batch/Heat Number.
- d) 'SGCI' marking.
- e) Drawing number (preferably last 03 digits).

#### 9.0. PACKING:

- i) The components shall be suitably packed to prevent transit/long storing damage.
- ii) The components shall be coated with antirust varnish/compound after inspection.
- iii) Varnished components shall be wrapped in polythene paper followed by corrugated paper.
- iv) The wrapped components shall finally be sealed in thick polythene bag.
- v) All sealed components in a kit bearing same serial number shall be finally packed in single wooden crate separated by different wooden compartments for each item, properly lined/padded by big bubble wrapper/thick foam/thermocool sheets to prevent transit damage to machined surfaces.
- vi) Packing list shall be provided on the boxes.

#### 10.0. DEVIATION:

- 10.1 While submitting the offer, the tenderer shall furnish a list of deviation, if any, from this, specification and relevant drawings, and the manufacturing facility as per RDSO's STR No. RDSO/2007/EL/STR/0021, Rev-1 or Latest. Even if the tenderer has no particular deviation in their offer, a NIL statement shall be submitted.

11.0. Clause wise comments have to be furnished by the tenderer. Vague comments like noted and understood are not acceptable. Compliance have to be clearly stated, otherwise, CLW reserves the right to reject the offer.

12.0. Metallurgical testing for prototype supplies shall be carried out by Dy.CC&M/CLW/CRJ or NABL approved laboratory for which sample to be drawn, stamped & sealed by authorised representative of Dy.CEE/TMD/CLW/CRJ and for bulk supplies metallurgical test shall be done by Dy.CC&M/CLW/CRJ or NABL approved laboratory, to be witnessed by authorised representative of CLW Zonal Inspection Cell.

13.0. Firms shall make bulk procurement of individual items required for subassemblies or complete equipments from Part-I source of CLW/RDSO only. Procurement from Part-II sources can be made up to 15% of total procurable qty. or the highest qty. of a past order successfully executed in Rlys. Units/PUs in the preceding three years. Upper limit of qty. to be procured from such Part-II source will not exceed 25% of the net procurable qty. in a given procurement case. In case where Part-I source is not available, material may be procured from Part-II sources of respective items as indicated in ASL of CLW/RDSO. Firm shall keep all such procurement records and will submit the same to inspecting agency at the time of inspection to ensure that above procurement procedure is strictly adhered to.

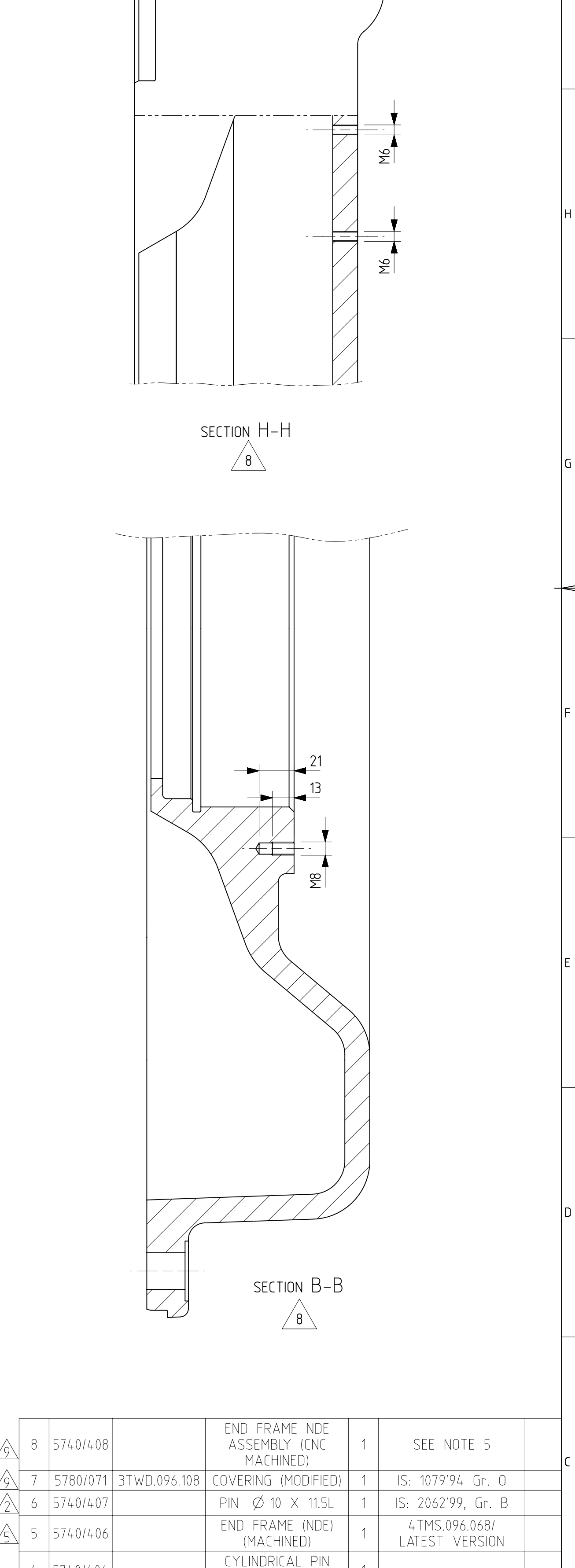
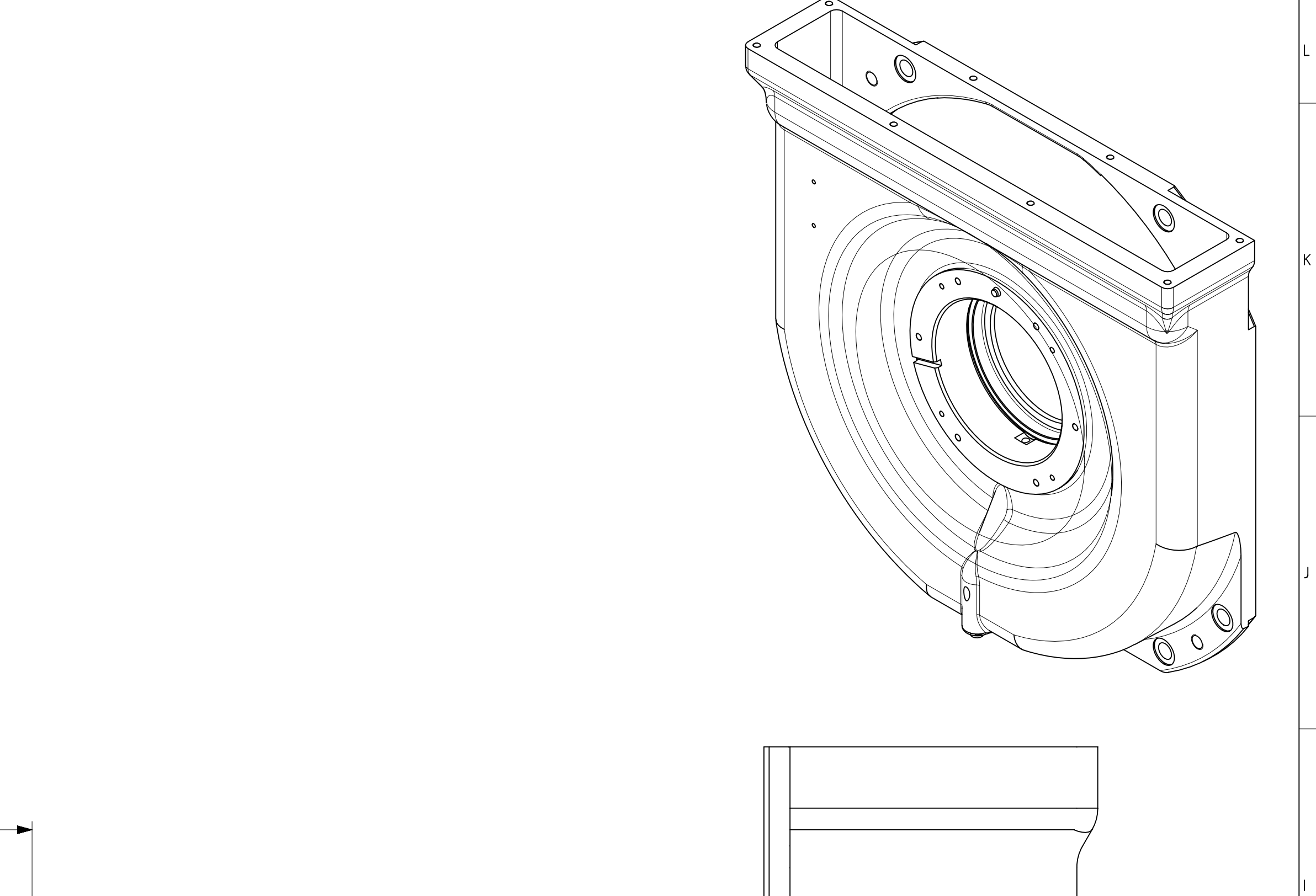
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THE DETAILS OF ITEMS COVERED IN THIS SPECIFICATION FOR  
“ASSOCIATED COMPONENTS OF MACHINED STATOR ASSLY.”  
FOR TM TYPE 6FRA-6068 ARE GIVEN BELOW:-

Sl. No.	DESCRIPTION	CLW DRG. No.	QTY./TM	REMARKS
ASSOCIATED COMPONENTS OF MACHINED STATOR ASSLY.				
1	END FRAME/DE	1TWD.096.005	1 No.	
2	END FRAME/NDE	0TWD.096.003	1 No.	
3	SPEED PROBE HOUSING	1TWD.096.077	1 No.	
4	OUTER BEARING CAP/DE	1TWD.096.006	1 No.	
5	CLAMP PLATE/NDE	2TWD.096.033	1 No.	
6	BEARING CAP/NDE	3TWD.096.032	1 No.	
7	INNER LABYRINTH/DE	4TWD.096.028	1 No.	
8	INNER LABYRINTH/NDE	4TWD.096.031	1 No.	
9	INNER LABYRINTH/NDE	4TWD.096.042	1 No.	
10	INNER LABYRINTH/DE	4TWD.096.043	1 No.	
11	OUTER LABYRINTH/DE	4TWD.096.029	1 No.	


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				<b>PRAMANIK</b>	




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INVENTORY NO.	SIGN. & DATE	REF. DRG. NO.
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TACK WELD 10 PLACES  
EQUALLY SPACED



A close-up view of the top of the wheel assembly, showing the hub and the upper portion of the spokes. The hub is a circular plate with a central mounting point. The spokes are curved and radiate from the hub. The entire assembly is made of a light-colored material, likely aluminum or a similar metal.

ALL POCKET OPENING SURFACES  
TO BE UNIFORM WITHOUT  
ANY WAVINESS/UNEVENNESS  
TO BE CHECKED BY GAUGE  
AS PER TME/SKETCH/1290

1. CASTING SHALL BE DELIVERED WITHOUT IT, NO. 002 & 006.
2. ALL 07 NOS. "△" MARKED DIMENSION ARE CRITICAL CASTING DIMS. & TO BE ENSURED IN CASTING.
3. IT, NO. 005 TO BE DRESSED SUITABLY WHILE TACK WELDING. FIRM TO ENSURE PLACEMENT OF IT, 005 SUCH THAT OPENING IN END FRAME IS NOT BLOCKED AT ANY LOCATION BY SOLID SECTION OF IT, 005.
4. PUNCHING TO BE DONE AT THE SHOWN LOCATION BY MACHINIST. SIZE-  
OF PUNCHING TO BE 10-15MM. PUNCHING SHOULD NOT BE  
MACHINED/DAMAGED DURING MACHINING AND SHALL BE RETAINED.
5. ITEM TO BE PLUGGED & WELDED AT LOCATION MARKED AS "X".
6. MATERIAL: SPHEROIDAL GRAPHITE CAST IRON (SGGI) TO DIN  
- 1693 PART 1, GR- 666 40 OR GR- 400/18 OF IS:1865-1991/-  
(LATEST VERSION).
7. FIRM SHOULD HAVE THEIR OWN FOUNDRY DULY APPROVED BY  
RDSO AS CLASS-A FOUNDRY FOR CASTING THE RAW MATERIAL  
OF SPECIFIED GRADE SGI CASTING FOR ITEM END FRAME/DE &  
NDE OR THEY HAVE TO SUBMIT ADEQUATE DOCUMENTARY EVIDENCE  
REGARDING SOURCE OF RAW MATERIAL (CASTING) FROM RDSO  
APPROVED CLASS-A FOUNDRY ONLY.
8. ALL 29 NOS. "◇" MARKED DIMENSION AND NOTES ARE CRITICAL TO QUALITY (CTQ)  
& SL. NO. OF CTQ DIMENSION AND NOTES ARE INSCRIBED IN ◇ e.g. (29).
9. (a) EMBOSING TO BE DONE BY CASTING MANUFACTURER AT THIS LOCATION AS PER  
CLAUSE 8.1 OF SPECIFICATION TM11491 REV.05 (OR LATEST).
- (b) ETCHING/ PUNCH MARKING TO BE DONE BY MACHINIST AT THIS LOCATION  
AS PER CLAUSE 8.2 OF SPECIFICATION TM11491 REV.05 (OR LATEST).
- SIZE OF EMBOSING/MARKING TO BE 5-20MM. EMBOSING & MARKING SHOULD BE  
LEGIBLE AND SHOULD NOT BE MACHINED/DAMAGED DURING MACHINING AND SHALL  
BE RETAINED.
10. SURFACE FINISH OF UNMACHINED CASTED SURFACE TO BE AS PER IS3073  
(IN CASE MACHINING ALL OVER IS NOT MENTIONED OR SOME SURFACES ARE NOT  
INDICATED FOR MACHINING BY SYMBOL.)
11. MACHINING ALLOWANCE ON EACH TOOL POINT TO BE 5-7 MM IN CASE CASTING IS  
SUPPLIED OR 3-5 MM IN CASE ROUGH MACHINED CASTING IS SUPPLIED.
12. FOR OTHER QUALITY REQUIREMENT WHICH ARE NOT CALLED IN DRAWING SPECIFICATION  
TM12545 TO BE REFERRED.
13. QAP FOR CASTING TO BE AS PER QTM/QAP/VENDOR/13-14/001 (LATEST REV.).
14. ADDITIONAL MATERIAL SHALL NOT BE PROVIDED ON SURFACES WHERE MACHINING SYMBOL  
IS NOT INDICATED. TOLERANCES ON UNTOLERATED CASTING SURFACES SHALL BE AS  
IS: 8350, CLASS-2.
15. DIMENSIONS TO BE CHECKED ON SAMPLE BASIS. QUANTUM OF  
INSPECTION SHALL BE AS GIVEN BELOW (AT LEAST ONE NUMBER):-
16. COMPONENT TO BE PRIMER PAINTED WITH INORGANIC ETHYL ZINC SILICATE PRIMER  
AS PER SCHEME NO. 8 OF TABLE-II (a) OF SPECIFICATION AA0674123 (PAGE NO. 2).
17. AFTER FINISH MACHINING PAINT INTERNAL SURFACE WITH INSULATING ENAMEL PAINT B  
CIT064 TO PROCESS SPEC. TM94217, CL.5 AT BHEL BHOPAL.

18. ROUGH M/C'D, CASTING SUPPLIER TO ENSURE 3 TO 5 MM DEPTH BETWEEN X & Y FACE, i.e. IF 4 MM. MACHINING ALLOWANCE IS KEPT ON 'X' FACE, THEN OVER ALL DEPTH FROM X TO Y FACE IN ROUGH M/C'D, CASTING SHALL BE 4+(3 TO 5) MM.
19. GREASE HOLE DIA. 9MM TO BE THOROUGHLY CLEANED & FREE FROM CHIPS, SAME IS TO BE ENSURED BY CHECKING WITH A STEEL BAR OF DIA. 3 MM AND MINIMUM 505 MM LENGTH.
20. ALL MACHINED/ R.MACHINED SURFACES TO BE PROTECTED WITH TRP.
21. MANUFACTURER SHALL MACHINE THE BORE OF BEARING HOUSING OF END FRAME DE FOR A DIMENSION NEAR 319.960mm.

SEE NOTE-5

SECTION  
D-D

SECTION B-B

SECTION  
A-A

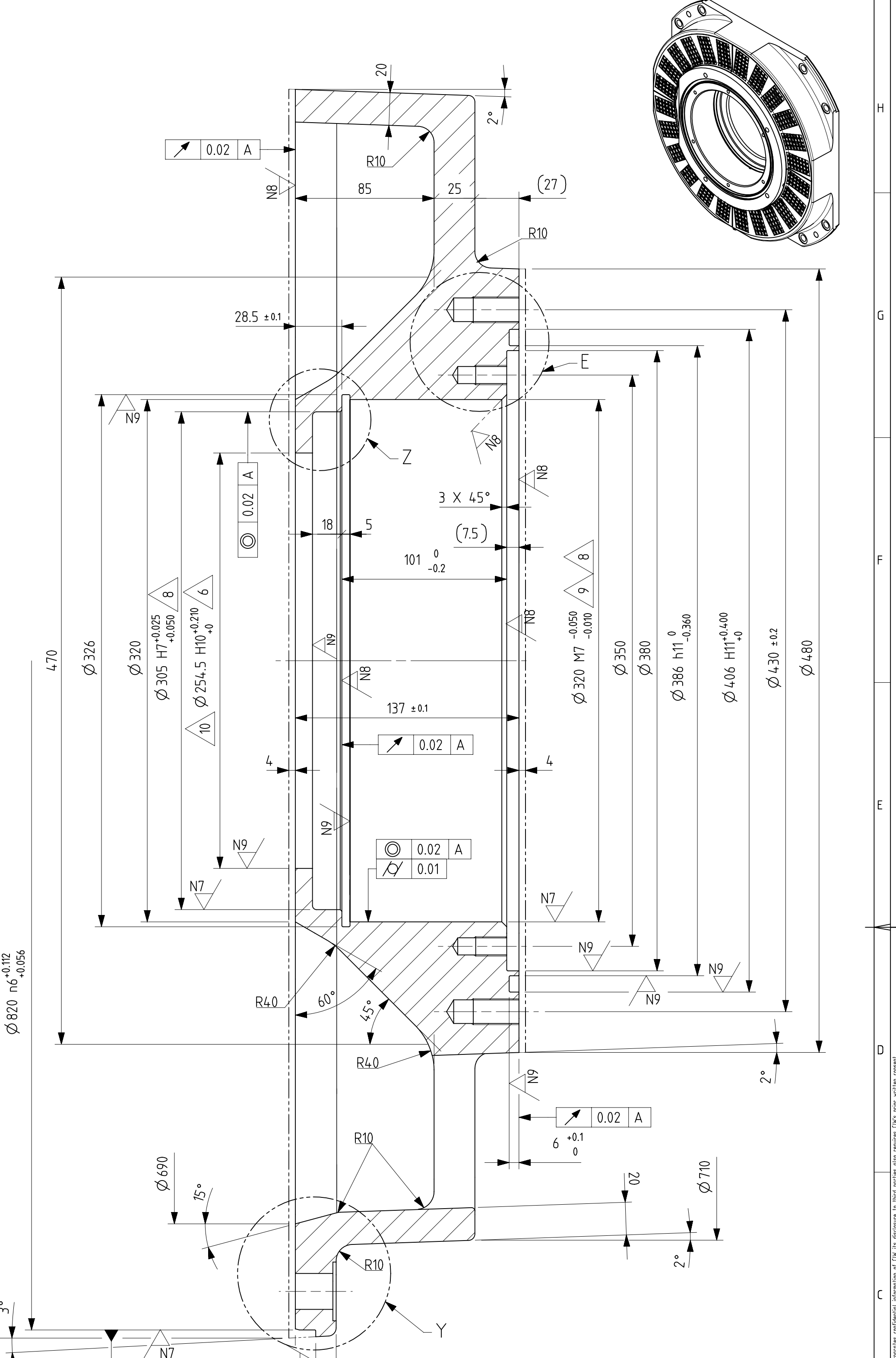
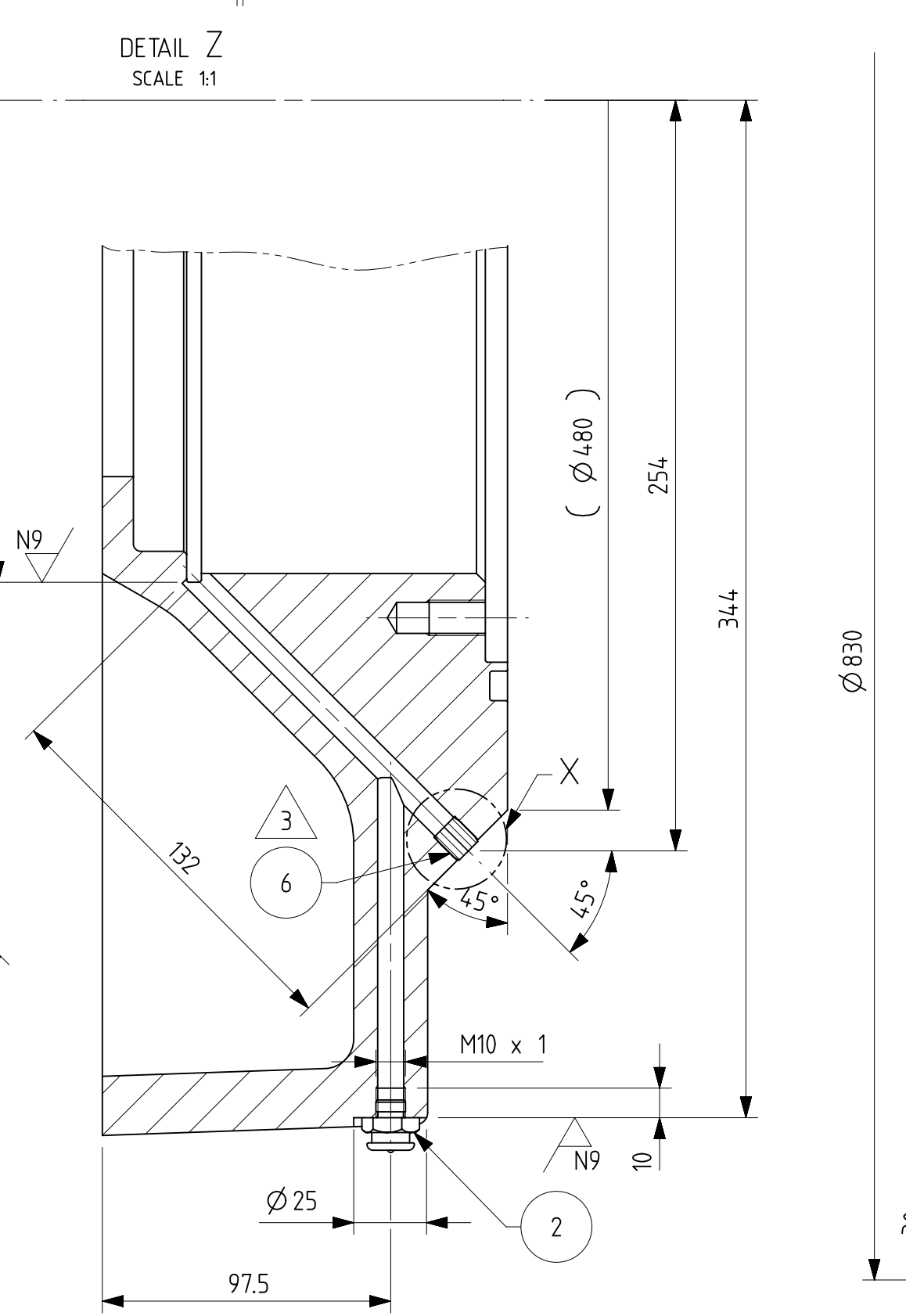
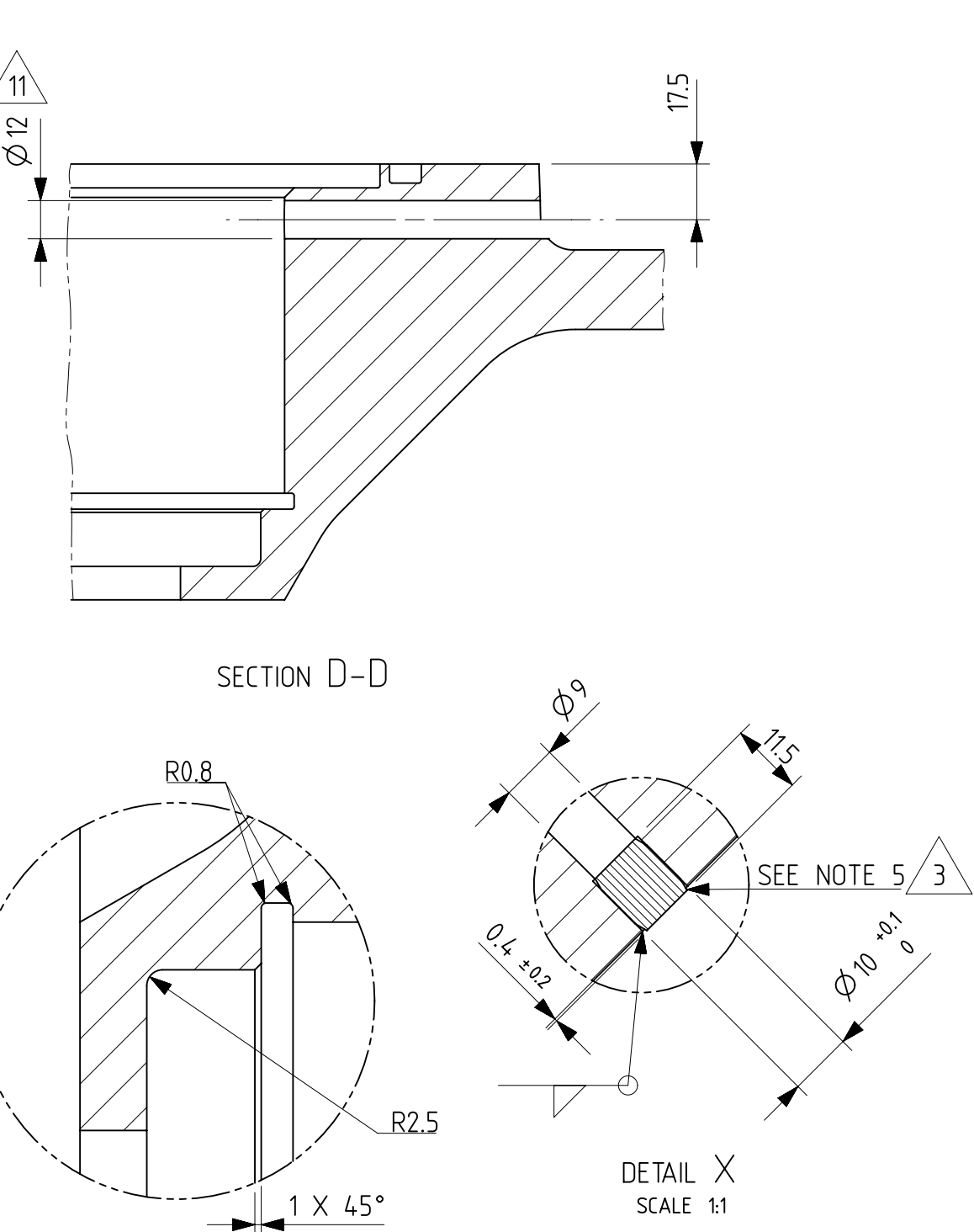
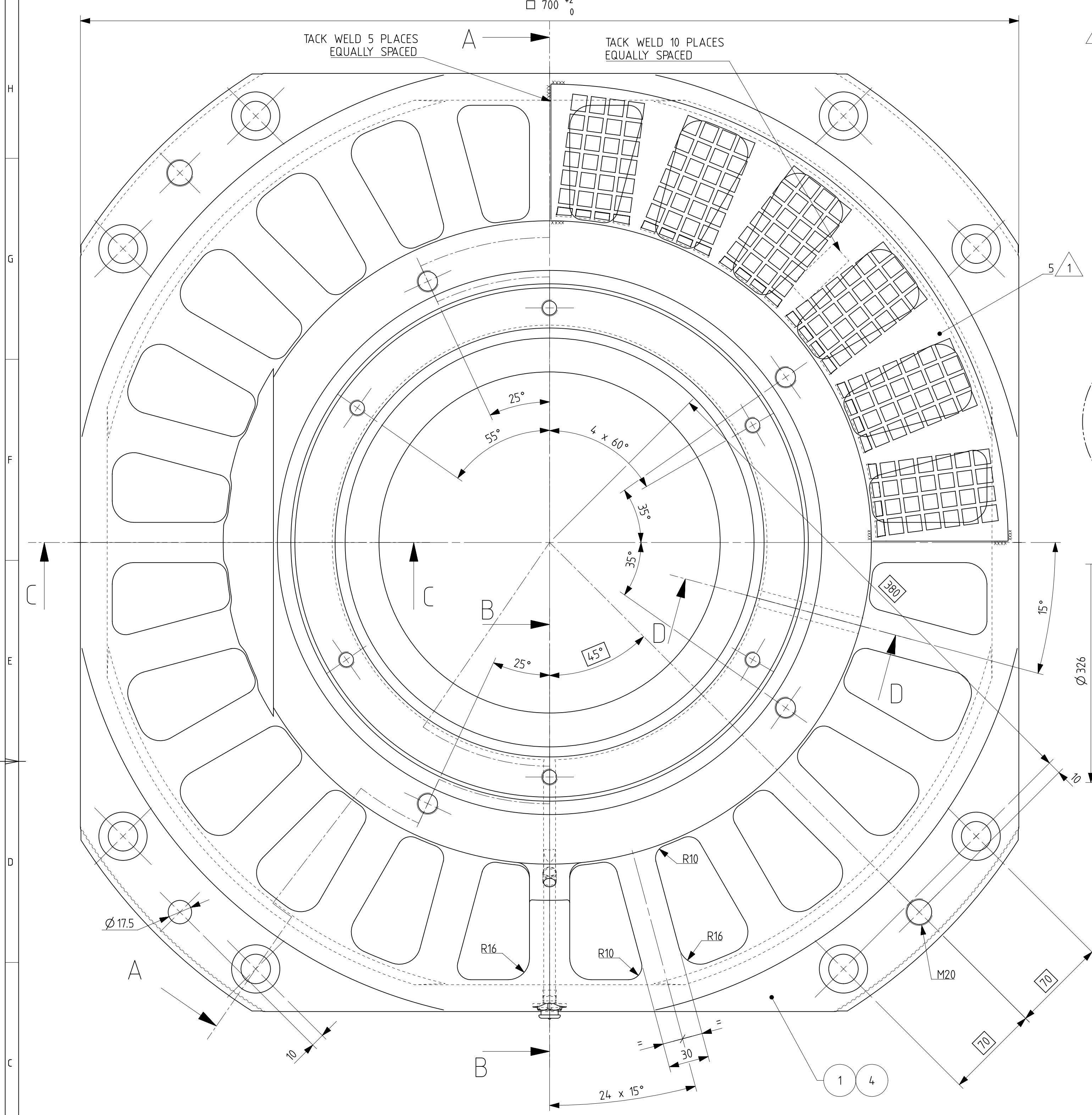
CASTING SURFACE SHALL NOT  
PROJECT BEYOND THIS SURFACE  
(SEE NOTE-18)

TOOL LIST		
IT.NO.	TOOL NO.	DESCRIPTION
001	1577825	GROOVE CKG GAUGE 10x6+0.1 DEEP
001	1577831	STEP GAUGE 12.5MM
001	1577833	DRILL JIG FOR 45° HOLE
001	1577834	DRILL JIG FOR HOLE IN SECTION--'DD'
001	1577836	DRILL JIG FOR REMAINING HOLES
001	1577873	GRINDING JIG WITH POT CHUCK
001	1578081	ANGLE PLATE FOR DRILLING 30° HOLE
001	1605177	FIXTURE FOR PERIPHERY MCNG FOR END SHIELD DE
—	1605203	TURNING FIXTURE

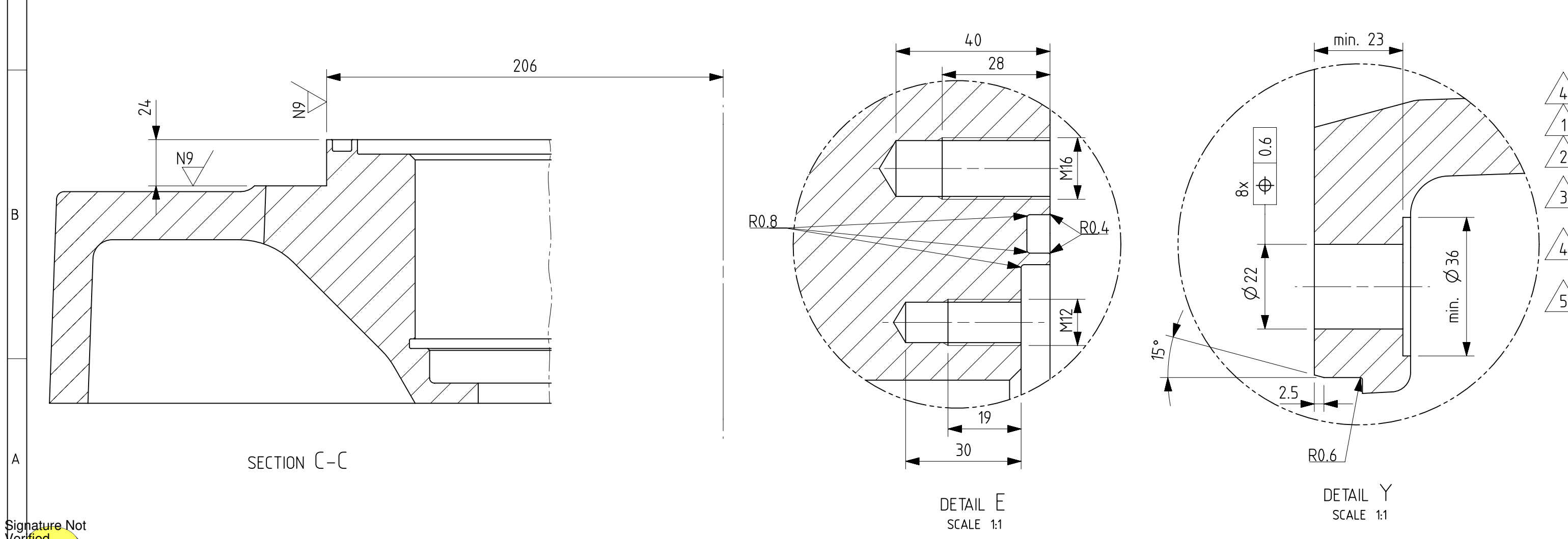
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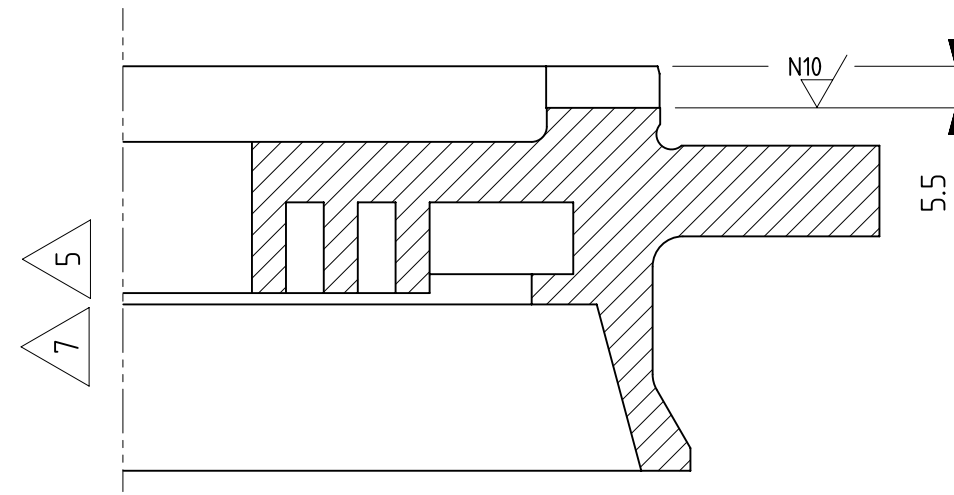
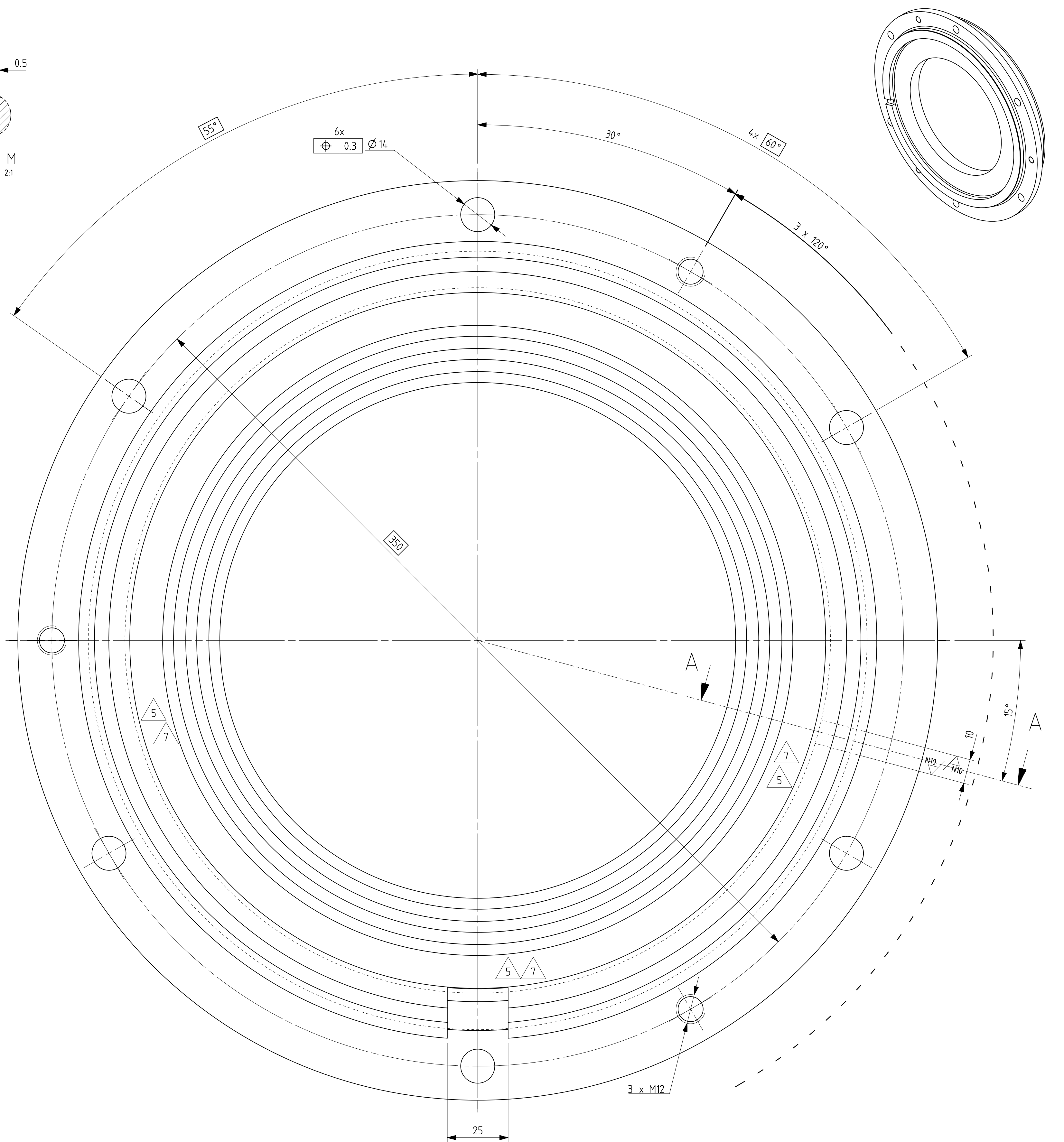
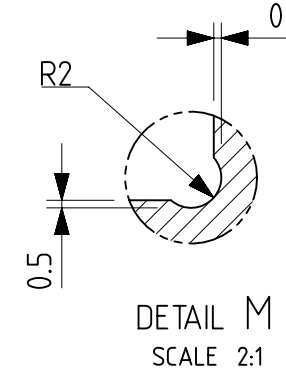
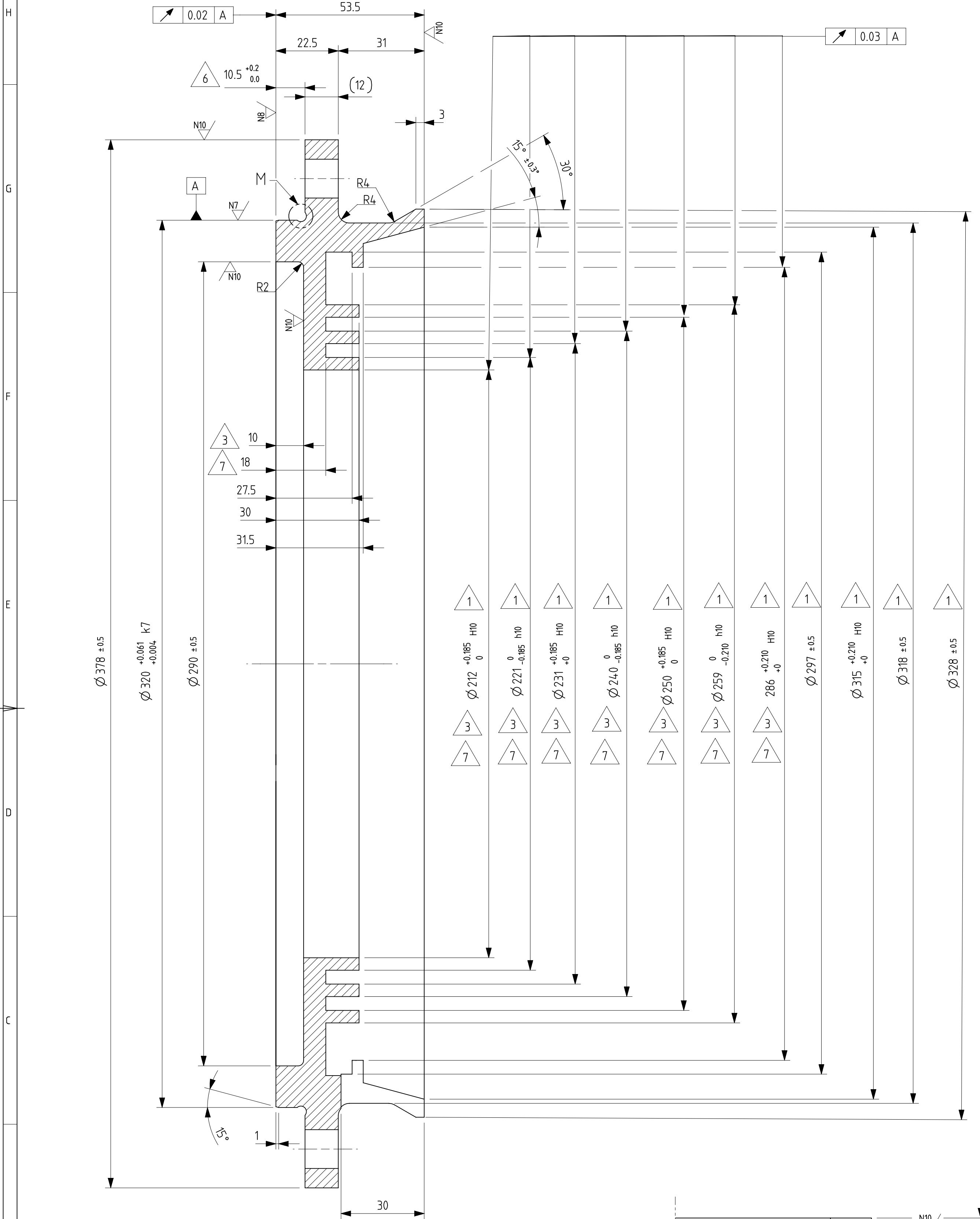




1. CASTING SHALL BE DELIVERED WITHOUT REF.- 2 & 3.
- 2.
3. REF. 5 TO BE DRESSED SUITABLY WHILE TACK WELDING.
4. METALLURGICAL TESTS TO BE CARRIED OUT BY DY.CC&M/CRJ.
5. ITEM NO 3 i.e EXPANDING DOWEL DELETED, IN LIEU OF, A PIN  
SIZE : Ø 10X115 L TO BE PLUGGED & WELDED AT LOCATION MARKED  
AS 'X'.
6. MATERIAL:- SPHEROIDAL GRAPHITE CAST IRON (SGCI) TO DIN-1693  
PART-1, GR-GGG-40 OR GR-400/18 OF IS:1865-1991/ (LATEST VERSION)
7. FIRM SHOULD HAVE THEIR OWN FOUNDRY DULY APPROVED BY RDSO  
CLASS-A FOUNDRY FOR CASTING THE RAW MATERIAL OF SPECIFIED GR  
SGCI CASTING FOR ITEM END FRAME/ DE & NDE OR THEY HAVE TO S  
ADEQUATE DOCUMENTARY EVIDENCE REGARDING SOURCE OF RAW MATER  
(CASTING) FROM RDSO APPROVED CLASS-A FOUNDRY ONLY.

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NOTE:-  
1. REMOVE ALL SHARP EDGES.  
2. MATERIAL:- SPHEROIDAL GRAPHITE CAST IRON (SGCI)  
TO DIN-1693 PART-1, GR-GGG/40 OR GR-400/18 OF  
IS:1865-1991 (LATEST VERSION) TO SPECN. NO.  
4TMS.096.068 (LATEST VERSION)

GENERAL TOLERANCE FOR LINEAR AND ANGULAR MEASUREMENTS FOR MACHINING ACCORDING TO ISO 2768					
RATED MEASUREMENTS RANGE	> 0.5 TO 3.0	> 3 TO 6	> 6 TO 30	> 30 TO 120	> 120 TO 400
DEVIATION GRADE	± 0.1	± 0.1	± 0.2	± 0.3	± 0.5

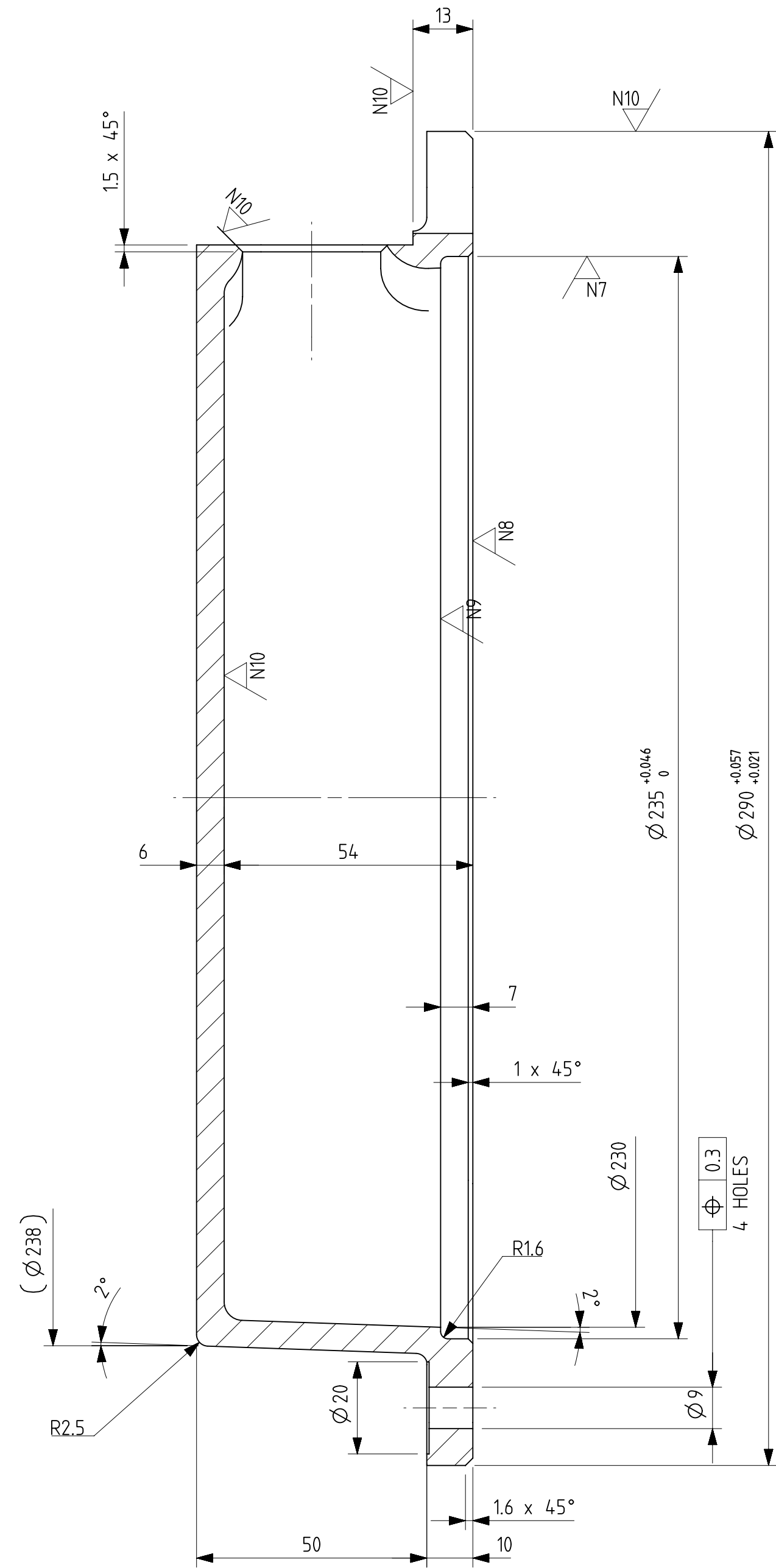
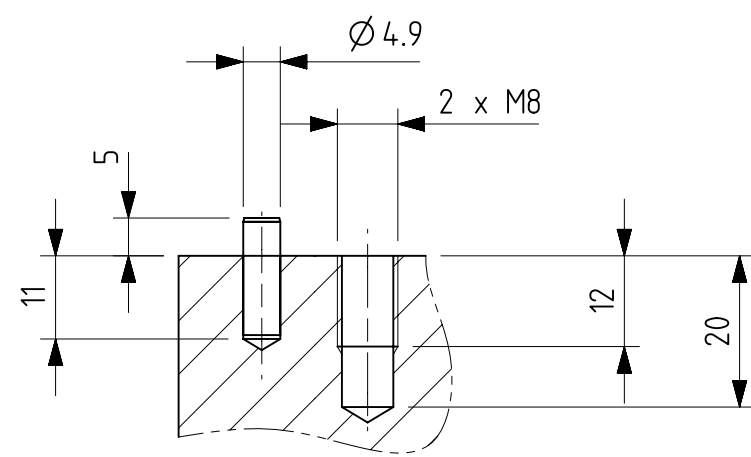
Signature Not Verified  
Digitally signed by  
Ravindra Kumar  
Date: 2023.05.13  
3:34:05 AM  
Reason: I am the signatory

SECTION A-A

C&D NO: 5780/056  
QTY./TM: 1 NO.

धातु-वेल्डिंग विधि		अतिरिक्त चर्चा - सीमा मा. : 2102 / अ. मा. सं. : 2768 UNSPECIFIED TOLERANCE TO G. 2702 / IS. 2708										CL. 10.								
मा. मा. : 813 / अ. मा. सं. : 2553																				
WELDING SYMBOLS TO IS:813 / IS:2553																				
परमक GRADE NO.	सं 1	चिह्न N1	सं 2	चिह्न N2	सं 3	चिह्न N3	सं 4	चिह्न N4	सं 5	चिह्न N5	सं 6	चिह्न N6	सं 7	चिह्न N7	सं 8	चिह्न N8	सं 9	चिह्न N9	सं 10	चिह्न N10
R2	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1	8.9.4.1
मा. मा. : 3073 / अ. मा. सं. : 1302																				
SURFACE ROUGHNESS VALUE TO IS:3073 / IS:1302																				
चिह्न	SYMBOL				SYMBOL				SYMBOL				SYMBOL							
7																				

अनुमोदित SIGN		अनुमोदित CHD SSE		अनुमोदित REVIEWED		अनुमोदित APPROVED		अनुमोदित DATE	
7	DY/CEE/TM	6	DY/CEE/TM	5	DY/CEE/TM	4	DY/CEE/TM	3	DY/CEE/TM
ALT. 3 & 5 WITHDRAWN REF. CLW / TM / 18059 / PT. 1 DTD. 06.07.19		TOLERANCE INCORPORATED IN DRG. FROM 10.5 TO 10.5 ± 0.0 VIDE LETTER NO. CLW/TM/8059/PART DATED 20-10-2007		10.5 ± 0.0 VIDE LETTER NO. CLW/TM/8059/PART DATED 20-10-2007		10.5 ± 0.0 VIDE LETTER NO. CLW/TM/8059/PART DATED 20-10-2007		10.5 ± 0.0 VIDE LETTER NO. CLW/TM/8059/PART DATED 20-10-2007	
DRG. TOLERANCES ALTERED COMPARED TO HTM.		DRG. TOLERANCES ALTERED COMPARED TO HTM.		DRG. TOLERANCES ALTERED COMPARED TO HTM.		DRG. TOLERANCES ALTERED COMPARED TO HTM.		DRG. TOLERANCES ALTERED COMPARED TO HTM.	
MATERIAL GRADE & SPECIFICATION CHANGED VIDE NOTE NO. CLW/TM/8009 DATED 6-11-2007. NOTE 2 ADDED.		MATERIAL GRADE & SPECIFICATION CHANGED VIDE NOTE NO. CLW/TM/8009 DATED 6-11-2007. NOTE 2 ADDED.		MATERIAL GRADE & SPECIFICATION CHANGED VIDE NOTE NO. CLW/TM/8009 DATED 6-11-2007. NOTE 2 ADDED.		MATERIAL GRADE & SPECIFICATION CHANGED VIDE NOTE NO. CLW/TM/8009 DATED 6-11-2007. NOTE 2 ADDED.		MATERIAL GRADE & SPECIFICATION CHANGED VIDE NOTE NO. CLW/TM/8009 DATED 6-11-2007. NOTE 2 ADDED.	
TOLERANCE VALUE AND GENERAL TOLERANCE TABLE INCORPORATED.		TOLERANCE VALUE AND GENERAL TOLERANCE TABLE INCORPORATED.		TOLERANCE VALUE AND GENERAL TOLERANCE TABLE INCORPORATED.		TOLERANCE VALUE AND GENERAL TOLERANCE TABLE INCORPORATED.		TOLERANCE VALUE AND GENERAL TOLERANCE TABLE INCORPORATED.	
REDRAWN IN NX WITH 3RD ANGLE PROJECTION		REDRAWN IN NX WITH 3RD ANGLE PROJECTION		REDRAWN IN NX WITH 3RD ANGLE PROJECTION		REDRAWN IN NX WITH 3RD ANGLE PROJECTION		REDRAWN IN NX WITH 3RD ANGLE PROJECTION	
APPROVED DYCEE		APPROVED DYCEE		APPROVED DYCEE		APPROVED DYCEE		APPROVED DYCEE	
DATE		DATE		DATE		DATE		DATE	
25-09-20		25-09-20		25-09-20		25-09-20		25-09-20	
SCALE		SCALE		SCALE		SCALE		SCALE	
1:1		1:1		1:1		1:1		1:1	
3EHM112045		3EHM112045		3EHM112045		3EHM112045		3EHM112045	
AUTHY		AUTHY		AUTHY		AUTHY		AUTHY	
वर्णन		वर्णन		वर्णन		वर्णन		वर्णन	
DESCRIPTION		DESCRIPTION		DESCRIPTION		DESCRIPTION		DESCRIPTION	
OUTER BEARING CAP. (DE) (MACHD.)		OUTER BEARING CAP. (DE) (MACHD.)		OUTER BEARING CAP. (DE) (MACHD.)		OUTER BEARING CAP. (DE) (MACHD.)		OUTER BEARING CAP. (DE) (MACHD.)	
DRAWING NO.		DRAWING NO.		DRAWING NO.		DRAWING NO.		DRAWING NO.	
1TWD.096.006		1TWD.096.006		1TWD.096.006		1TWD.096.006		1TWD.096.006	
परिवर्तन संख्या		परिवर्तन संख्या		परिवर्तन संख्या		परिवर्तन संख्या		परिवर्तन संख्या	
7		7		7		7		7	
पृष्ठ		पृष्ठ		पृष्ठ		पृष्ठ		पृष्ठ	
1 OF 1		1 OF 1		1 OF 1		1 OF 1		1 OF 1	
A1		A1		A1		A1		A1	



QTY./TM: 1 NO.

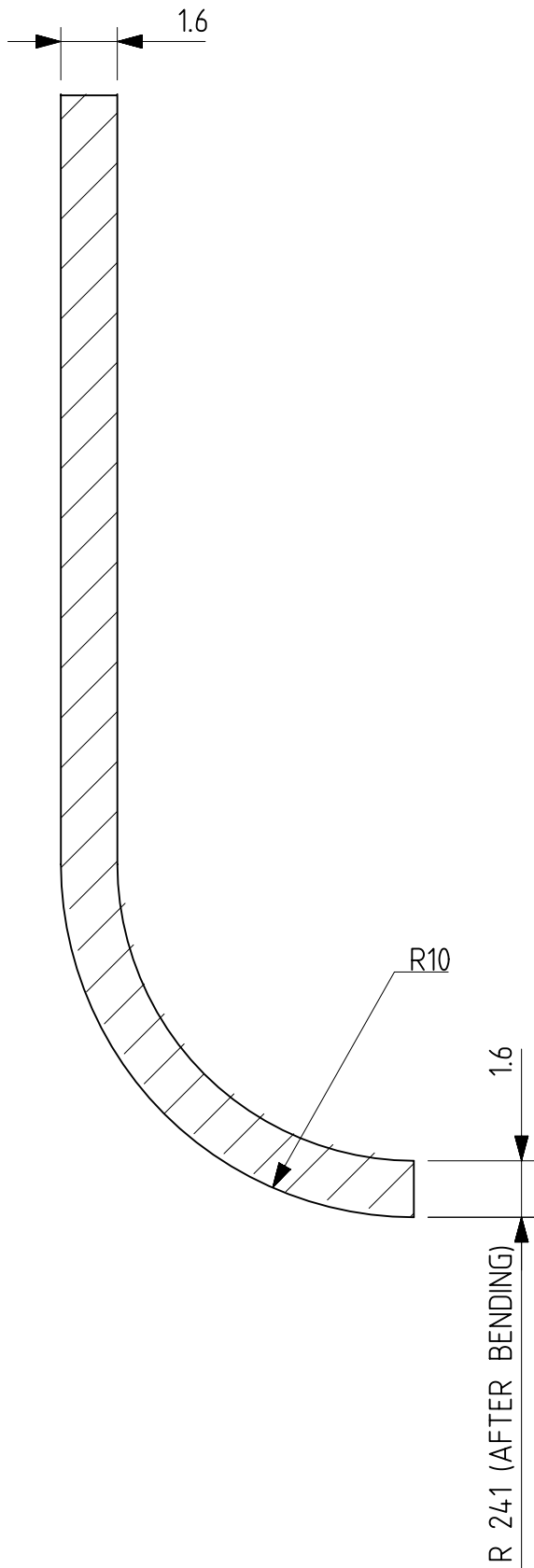
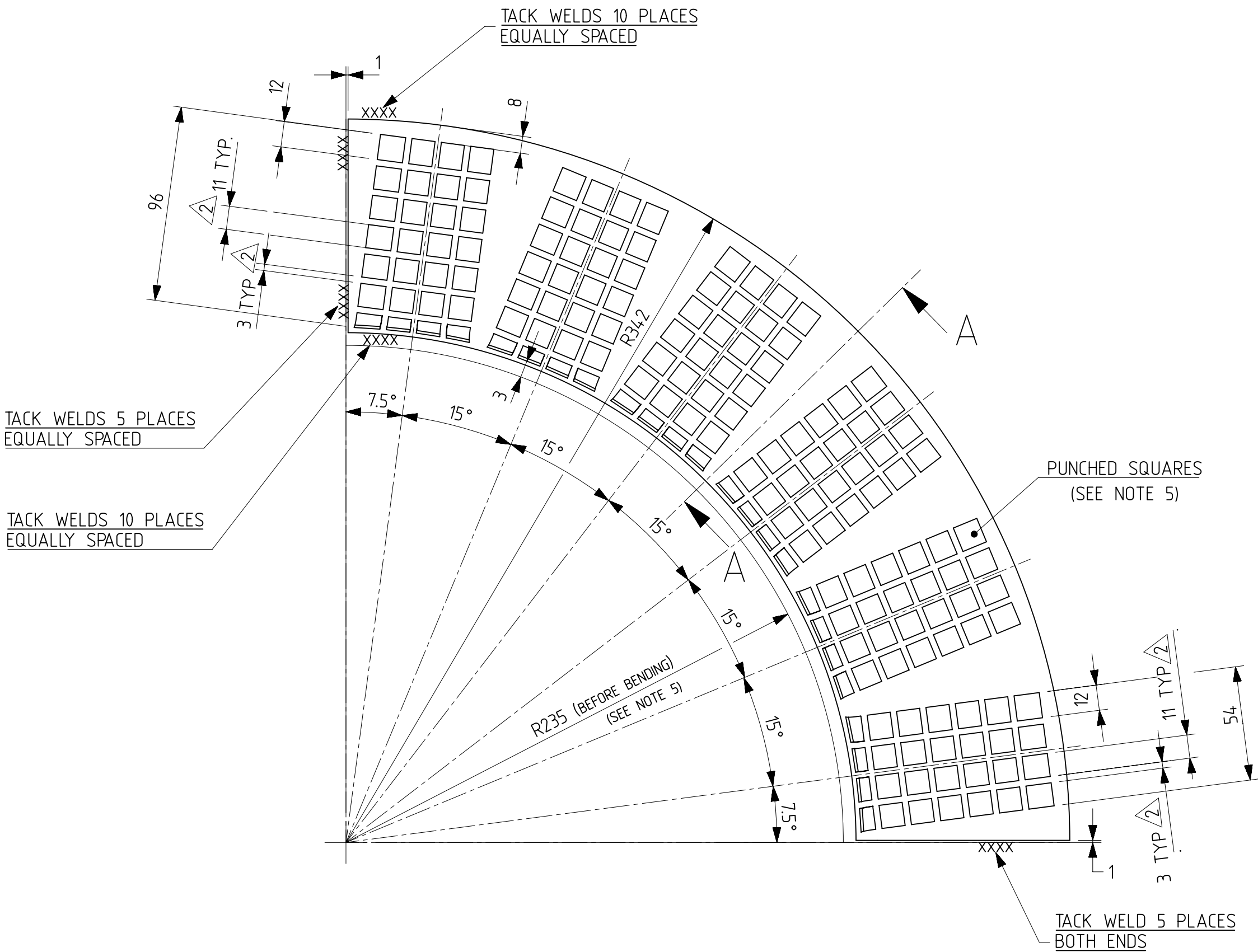
[illegible]

5	DYCEE/TMO	NEW C&O NO. ALLOTTED VIDE LETT NO. C/LW/TMO/10080 DATED 18.08.08		
4	-	REDRAWN IN NX WITH 3RD ANGLE PROJECTION		
3	-	MATERIAL GRADE & SPECIFICATION CHANGED. VIDE NOTE NO. C/LW/TMO/8009 DATED 05.12.2007 NOTE 5 ADDED.		
2	DYCEE/TMO	NOTE-6 ADDED.		
1	DYCEE/TMO	DRAWING MODIFIED & PREVIOUS DRG. SUPERSEDED.		
परिवर्तन संख्या	प्राधिकार	वर्णन	DESCRIPTION	
ALT. NO.	AUTHY			

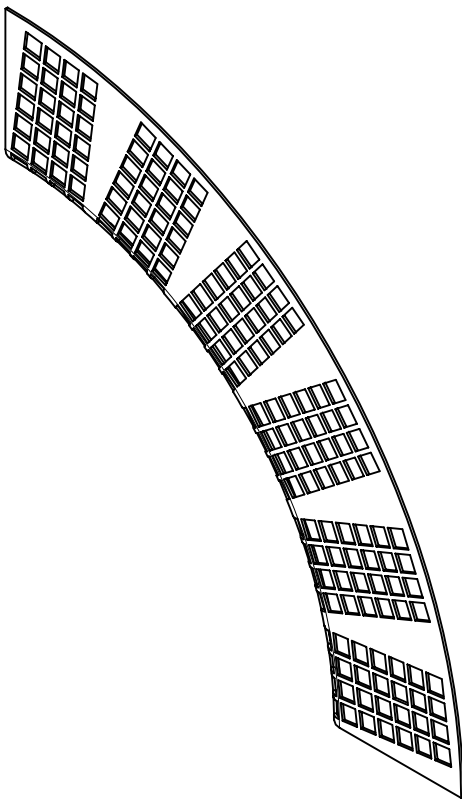
29-4-19	अनुमोदित संयुक्त APPROVED DTEC	वर्णन DESCRIPTION	SPEED PROBE HOUSING (CNC MACHINED)			
17-02-20	सिवांक DATE	25-09-20				
09-01-20	सिवांक अनुमोदित DATE	1:1				
20-03-20	सिवांक DATE	वर्णन / REF DRAWING NO	1TWD.096.077			
कारण REASON	3EHM11880	परिवर्तन संख्या AL-	5	पार्श्व SHEET	1 OF 1	A1



REDRAWN BY TCS



SECTION A-A  
SCALE 5:1



NOTES:-

- REMOVE SHARP CORNERS
- 4 NOS. OF ITEMS TO BE DRESSED SUITABLY WHILE TACK WELDING ON END FRAME.
- NET TO BE WELDED ON END FRAME BY USING NICKEL ELECTRODE TYPE 'XYRON 223' OF L&T MAKE OR TYPE SUPERFAN TO AWS/ SFAE. Ni-Cu-B OF ADVANI ORLICON MAKE
- NET TO BE RED PRIMER PAINTED
- PUNCHING TO BE DONE BEFORE BENDING.
- BEND THE PERFORATED COVER TO MATCH THE END FRAME DE

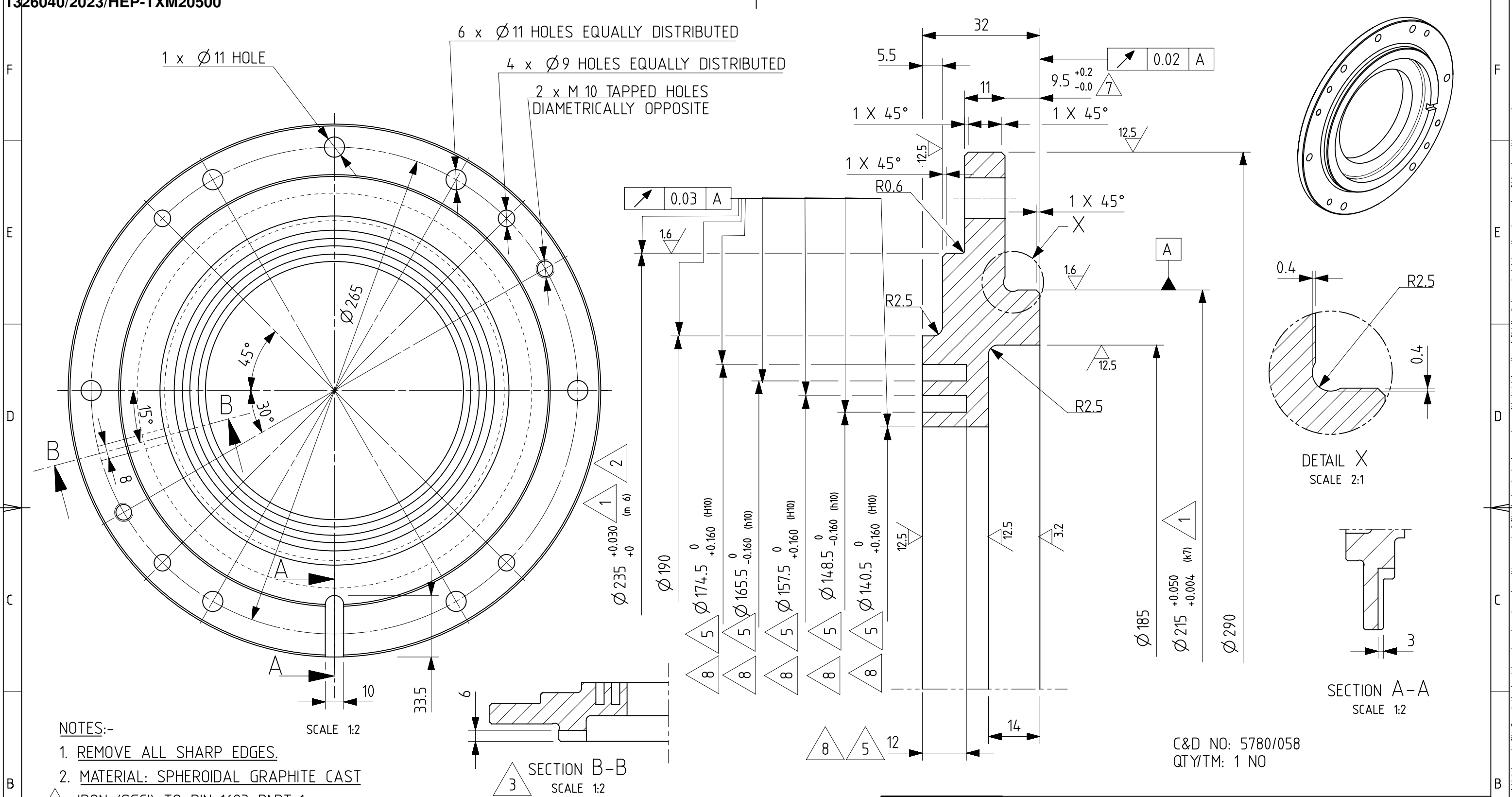
C&D NO: 5730/306  
QTY/TM: 4 NOS

Signature Not  
Verified  
Digitally signed by  
RAVINDRA KUMAR  
Date: 2023.07.13  
17:21:14 +05'30'  
Reason: I am PS-CRIS  
Location: New Delhi

धातु-वेल्डन चिन्ह		अनिर्दिष्ट सद्य - सीमा मा. मा. : 2102 / अ. मा. सं. : 2768												TOL. CLS.
मा. मा. : 813 / अ. मा. सं. :2553		UNSPECIFIED TOLERANCE TO IS : 2102 / ISO : 2768												
WELDING SYMBOLS TO IS:813 / ISO:2553		पदांक GRADE NO.	सं1 N1	सं2 N2	सं3 N3	सं4 N4	सं5 N5	सं6 N6	सं7 N7	सं8 N8	सं9 N9	सं10 N10	सं11 N11	सं12 N12
Rz			0.16-0.3	0.5-0.7	0.9-1.1	1.5-2.0	2.5-3.8	5.0-6.3	9.0-12	16-25	30-40	50-63	75-100	160-250
सतह - रुक्षता का मान		Ra <td>µm</td> <td>0.075</td> <td>0.05</td> <td>0.1</td> <td>0.2</td> <td>0.4</td> <td>0.8</td> <td>1.6</td> <td>3.2</td> <td>6.3</td> <td>12.5</td> <td>25</td>	µm	0.075	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25
मा. मा. 3073 / अ. मा. सं. 1302		SURFACE ROUGHNESS VALUE TO IS:3073 / ISO:1302												
चिन्ह SYMBOL														

3	DY.CEE/TMD	MATERIAL GRADE MODIFIED.	13-01-23
2	DY.CEE/TMD	DIMNS & MATL. GRADE OF NET ALTERED VIDE APPROVAL L/NO CLWTM/18051 DATED 24.01.2011	24-01-11
1		REDRAWN IN NX WITH 3RD ANGLE PROJECTION	12-11-09
परिवर्तन संख्या	प्राधिकार	वर्णन	DESCRIPTION
ALT. NO.	AUTHY		

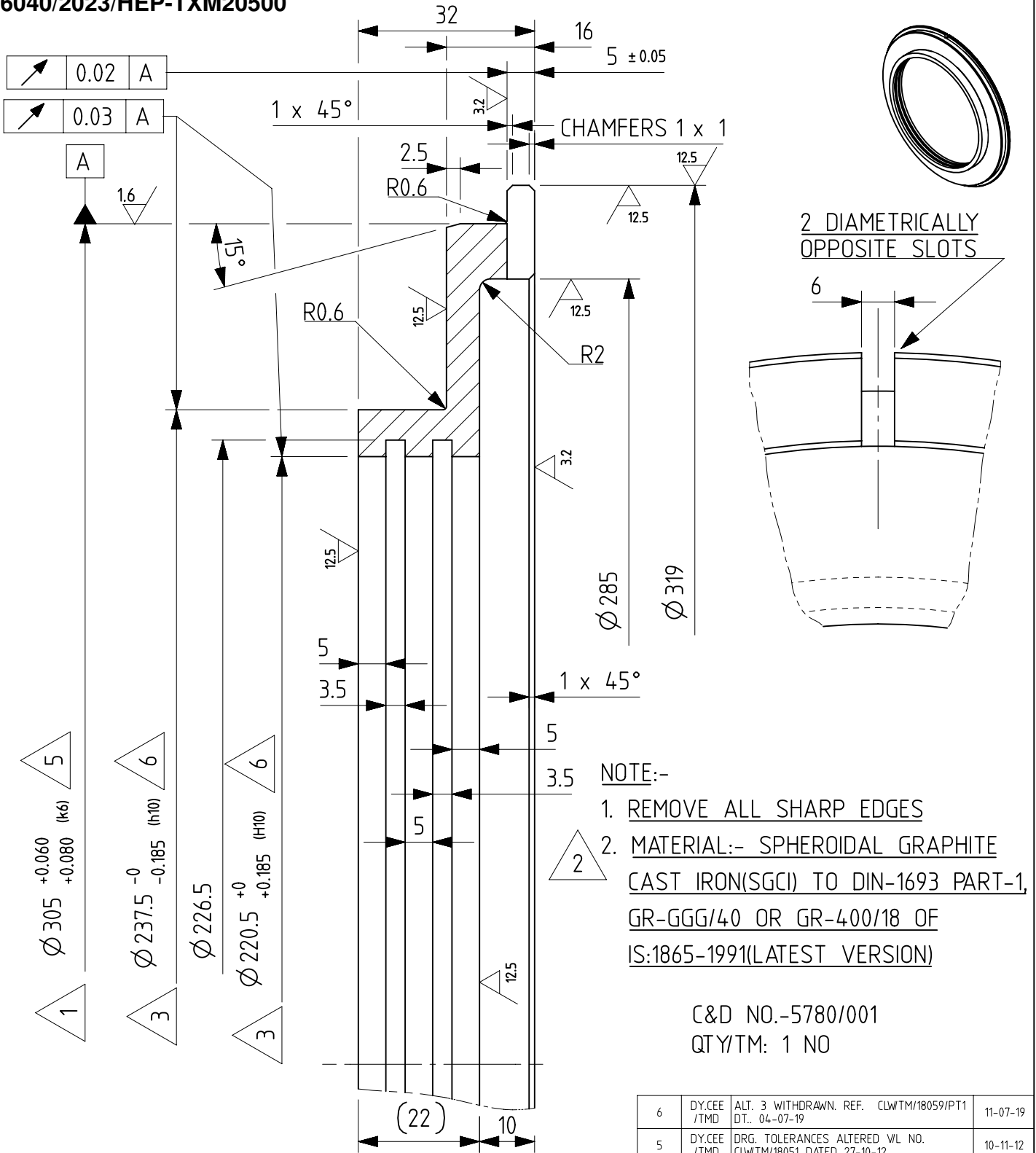
अनिकल्पित DGN		चितारंजन रेलइंजन कारखाना CHITTARANJAN LOCOMOTIVE WORKS, INDIA		
जीवा व.अ.अ. CHD SSE	RAVIN DRA KUMAR	पदार्थ M&L	प्रति भार कि. घा. WT. EACH IN KG	
समीक्षित स.वि.अ. / व.वि.अ.		विशिष्ट SPECN	IS:1079-2009, GR. HR1 OR LATEST	
अनुमोदित चक्रवि.अ. APPROVED DYCEE	RANJAN KUMAR PRIMA NIK	वर्णन	AIR OUTLET NET	
दिनांक DATE	13-01-2023	DESCRIPTION	2TWD.096.078	
संवि.अ. अनुपात SCALE	1:2	DRAWING NO.		
संवि.अ. / REF. CGI/201803	ALT-	परिवर्तन संख्या ALTERATION NO.	3	पर्ण SHEET
DATE INITIAL		1 OF 1		A2



<div>4</div> <div>RUN (SGCL) TO DIN-1693 PART-1, GR-GGG/40 OR GR-400/18 OF IS:1865-1991 (LATEST VERSION)</div>												<div>8</div>												<div>8</div> <div>ALT. 5 WITHDRAWN REF. CLWTM/18059/ PART-1 DATED 04-07-19</div> <div>7</div> <div>DY.CEE/TMD</div> <div>TOLERANCE INCORPORATED IN DRAWING FROM 9.5 TO 9.5<sup>+0.2</sup><sub>-0</sub> VIDE L/NO. CLWTM/18059 DT. 05-06-17</div> <div>05-06-17</div> <div>6</div> <div>REDRAWN IN NX WITH 3RD ANGLE PROJECTION</div> <div>18-11-09</div> <div>5</div> <div>DY.CEE/TMD</div> <div>DRG. TOLERANCES ALTERED COMPARED TO HTM.</div> <div>18-02-09</div> <div>4</div> <div>DY.CEE/TMD</div> <div>MATL. GR. &amp; SPECN. CHANGED VIDE NOTE NO. CLWTM/18009 DATED 06.11.2007 NOTE 2 ADDED</div> <div>20-11-07</div> <div>3</div> <div>DY.CEE/TMD</div> <div>GREASE OUT LET CHANNEL 8mm WIDTHx6mm DEPTH INCORPORATED VIDE L/NO EL/TM/3009 DATED 23.05.06 &amp; RDSO L/NO.EL/-3.2.182 DATED 02.5.2006</div> <div>23-05-06</div> <div>2</div> <div>DY.CEE/TMD</div> <div>TOLERANCE AGAINST DIMENSION Ø 235 CORRECTED VIDE NOTE EL/TM/3009 DATED 21.3.05</div> <div>21-03-05</div> <div>1</div> <div>DY.CEE/TMD</div> <div>AGAINST DIMENSION Ø 235 (m6) AND Ø 215 (K7) TOLERANCE CORRECTED</div> <div>18-12-98</div>												<div>अधिकृतित DGN</div> <div>11-07-19</div> <div>जॉचा व.अ.अ. CHD SSE</div> <div>समीक्षित स.वि.अ. / व.वि.अ. REVIEWED AEE / SEE</div> <div>अनुमोदित र.मु.वि.अ. APPROVED DYCEE</div> <div>दिनांक DATE</div> <div>रैखिक अनुपात SCALE</div> <div>संदर्भ / REF. 3EHM311758 ALT.-</div>												<div></div> <div>चितरंजन रेलइंजन कारखाना CHITTARANJAN LOCOMOTIVE WORKS, INDIA</div> <div>पदार्थ MATL</div> <div>विशिष्ट SPECN</div> <div>वर्णन DESCRIPTION</div> <div>आरेखण संख्या DRAWING NO.</div> <div>परिवर्तन संख्या ALTERATION NO.</div> <div>पुर्ण SHEET</div>												<div>SEE NOTE-2 <div>4</div></div> <div>4TMS.096.068 (LATEST VERSION) <div>4</div></div> <div>BEARING CAP (NDE) (MACHD.)</div> <div>3TWD.096.032</div> <div>8</div> <div>1 OF 1</div> <div>A3</div>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
<div>धातु-वेल्डन चिन्ह भा. मा. : 813 / अ. मा. सं. :2553</div> <div>अनिर्दिष्ट सद्य - सीमा भा. मा. : 2102 / अ. मा. सं. : 2768 UNSPECIFIED TOLERANCE TO IS : 2102 / ISO : 2768</div> <div>TOL. CLS.</div>												<div>पदांक GRADE NO.</div> <div>सं1 N1</div> <div>सं2 N2</div> <div>सं3 N3</div> <div>सं4 N4</div> <div>सं5 N5</div> <div>सं6 N6</div> <div>सं7 N7</div> <div>सं8 N8</div> <div>सं9 N9</div> <div>सं10 N10</div> <div>सं11 N11</div> <div>सं12 N12</div>												<div>Rz</div> <div>0.16-0.3</div> <div>0.5-0.7</div> <div>0.9-1.1</div> <div>1.5-2.0</div> <div>2.5-3.8</div> <div>5.0-6.3</div> <div>9.0-12</div> <div>16-25</div> <div>30-40</div> <div>50-63</div> <div>75-100</div> <div>160-250</div>												<div>Ra <math>\mu</math>m</div> <div>0.025</div> <div>0.05</div> <div>0.1</div> <div>0.2</div> <div>0.4</div> <div>0.8</div> <div>1.6</div> <div>3.2</div> <div>6.3</div> <div>12.5</div> <div>25</div> <div>50</div>												<div>चिन्ह SYMBOL</div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div>												<div>परिवर्तन संख्या ALT. NO.</div> <div>प्राधिकार AUTHY</div> <div>वर्णन DESCRIPTION</div> <div>दिनांकित DATED INITIAL</div>												<div>चिह्न संख्या CHITRANJAN 1</div> <div>चिह्न संख्या CHITRANJAN 2</div> <div>चिह्न संख्या CHITRANJAN 3</div> <div>चिह्न संख्या CHITRANJAN 4</div> <div>चिह्न संख्या CHITRANJAN 5</div> <div>चिह्न संख्या CHITRANJAN 6</div> <div>चिह्न संख्या CHITRANJAN 7</div> <div>चिह्न संख्या CHITRANJAN 8</div>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
<div>Signature No. Verified</div> <div>Digitally signed by Ravindra Kumar Date: 2022.05.13 13:38:42 +05'30'</div> <div>Reason: IRLPS-GRIS Location: New Delhi</div>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								</											



1326040/2023/HEP-TXM20500



NOTE:-

1. REMOVE ALL SHARP EDGES
2. MATERIAL:- SPHEROIDAL GRAPHITE CAST IRON(SGCI) TO DIN-1693 PART-1, GR-GGG/40 OR GR-400/18 OF IS:1865-1991(LATEST VERSION)

C&amp;D NO.-5780/001

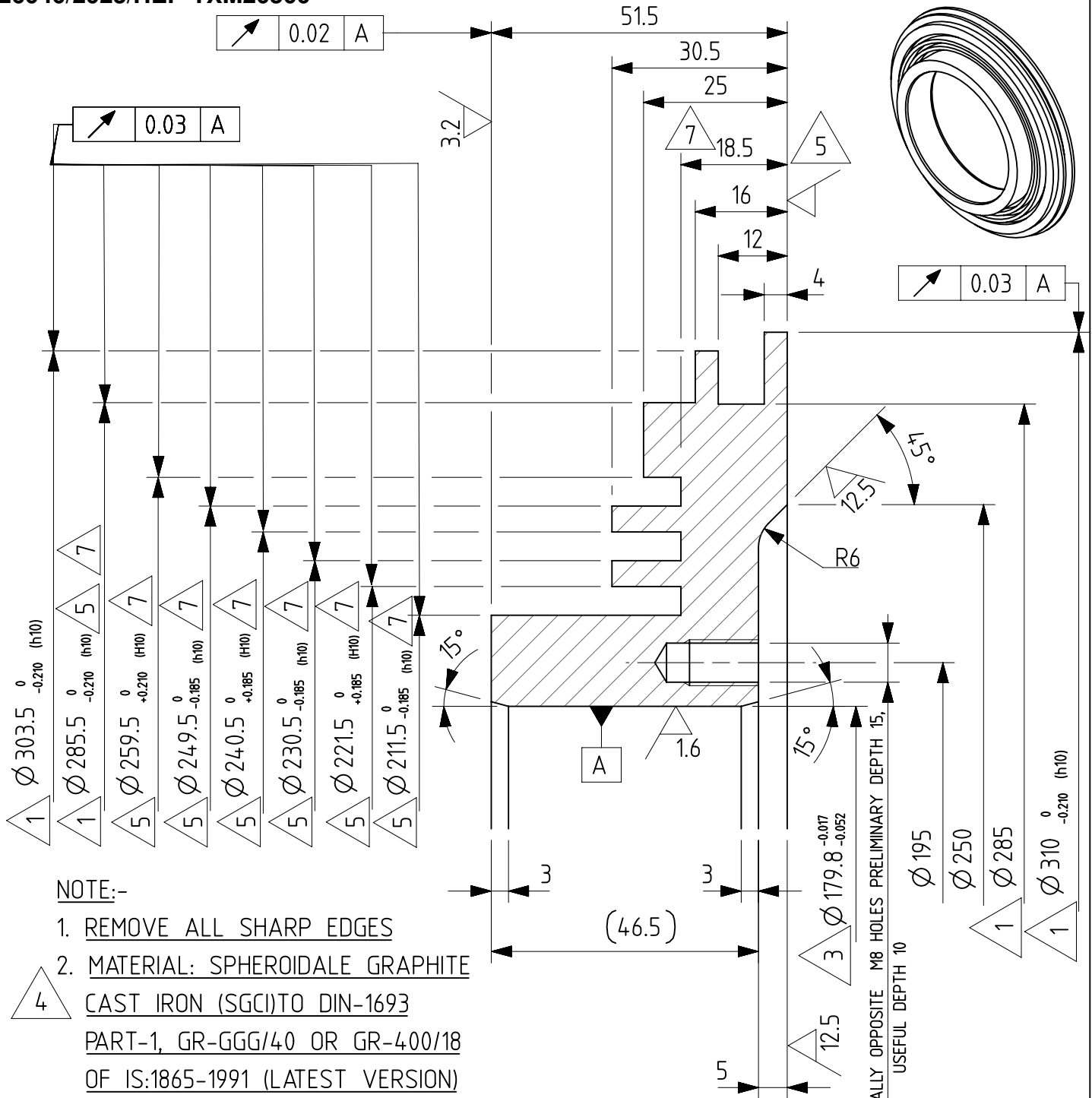
QTY/TM: 1 NO

6	DY.CEE /TMD	ALT. 3 WITHDRAWN. REF. CLW/TM/18059/PT1 DT.. 04-07-19	11-07-19
5	DY.CEE /TMD	DRG. TOLERANCES ALTERED W/L NO. CLW/TM/18051 DATED 27-10-12	10-11-12

4		REDRAWN IN NX WITH 3RD ANGLE PROJECTION		17-11-09	
6	3	DY.CEE /TMD	DRG. TOLERANCES ALTERED COMPARED TO H.T.M.	18-02-09	
	2	DY.CEE /TMD	MATL.GR. & SPECN CHANGED VIDE NOTE NO.CLW/TM/18009. DATED-06.11.2007. NOTE-2 ADDED.	20-11-07	
	1	DY.CEE /TMD	AGAINST DIMENSION Ø 305 TOLERANCE CORRECTED	03-12-97	
परिवर्तन संख्या		प्राधिकार	वर्णन	दिनांक	समीक्षित
ALT.NO.		AUTHY	DESCRIPTION	DATED INITIAL	REVIEWED AEE / SEE
सतह - रफता का मान मा. का. 3073 / अ. मा. सं. 1302		अनिर्दिष्ट सद्य - सीमा मा. मा. : 2102 / अ. मा. सं. : 2768		TOL. CLS.	
SURFACE ROUGHNESS VALUE TO IS:3073 / ISO:1302		UNSPECIFIED TOLERANCE TO IS : 2102 / ISO : 2768		अनुमोदित उमु.वि.अ.	
		धातु-वेल्डिंग चिह्न मा. मा. : 813 / अ. मा. सं.:2553		WELDING SYMBOLS TO IS:813 / ISO:2553	
				APPROVED DYCEE	
				दिनांक	
				DATE	
				07-08-20	
				रैखिक अनुपात	
				SCALE	
				1:1	
				संदर्भ / REF.	
				3EHM413061	
				ALT.-	



1326040/2023/HEP-TXM20500



6		REDRAWN IN NX WITH 3RD ANGLE PROJECTION	13-11-09
5	DY.CEE /TMD	DRG. TOLERANCES ALTERED COMPARED TO HTM	28-02-09
4	DY.CEE /TMD	MATL. GRADE & SPECN CHANGED VIDE NOTE NO CLW/TM/18009 DTD. 6.11.2007 NOTE 2 ADDED	20-11-07
3	DY.CEE /TMD	TOLERANCE ON DIA 179.8 CHANGED VIDE RDSO'S MODIFICATION NO.ELRS/MS/0314	22-07-02
2	DY.CEE	NEW C&D NO. FOR MODIFIED DESIGN INCORPORATED	09-08-00
1	DY.CEE /TMD	DIMENSIONS- Ø 293.5(h10), Ø 275.5(h10), Ø 275 & Ø 300(h10) MODIFIED AS PER LATEST VERSION OF ABB DRG.	10-12-99

परिवर्तन संख्या ALT.NO.	प्राधिकार AUTHY	वर्णन DESCRIPTION	दिनांक DATED INITIAL
सं2	सं3	सं4	सं5
सं6	सं7	सं8	सं9
सं10	सं11	सं12	

सं1	सं2	सं3	सं4	सं5	सं6	सं7	सं8	सं9	सं10	सं11	सं12
0.5-0.7	0.9-1.1	1.5-2.0	2.5-3.8	5.0-6.3	9.0-12	16-25	30-40	50-63	75-100	160-250	
0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50	

7	DY.CEE /TMD	ALT. 5 WITHDRAWN REF. CLW/TM/18059/PT-1 DT. 04-07-19	11-07-19
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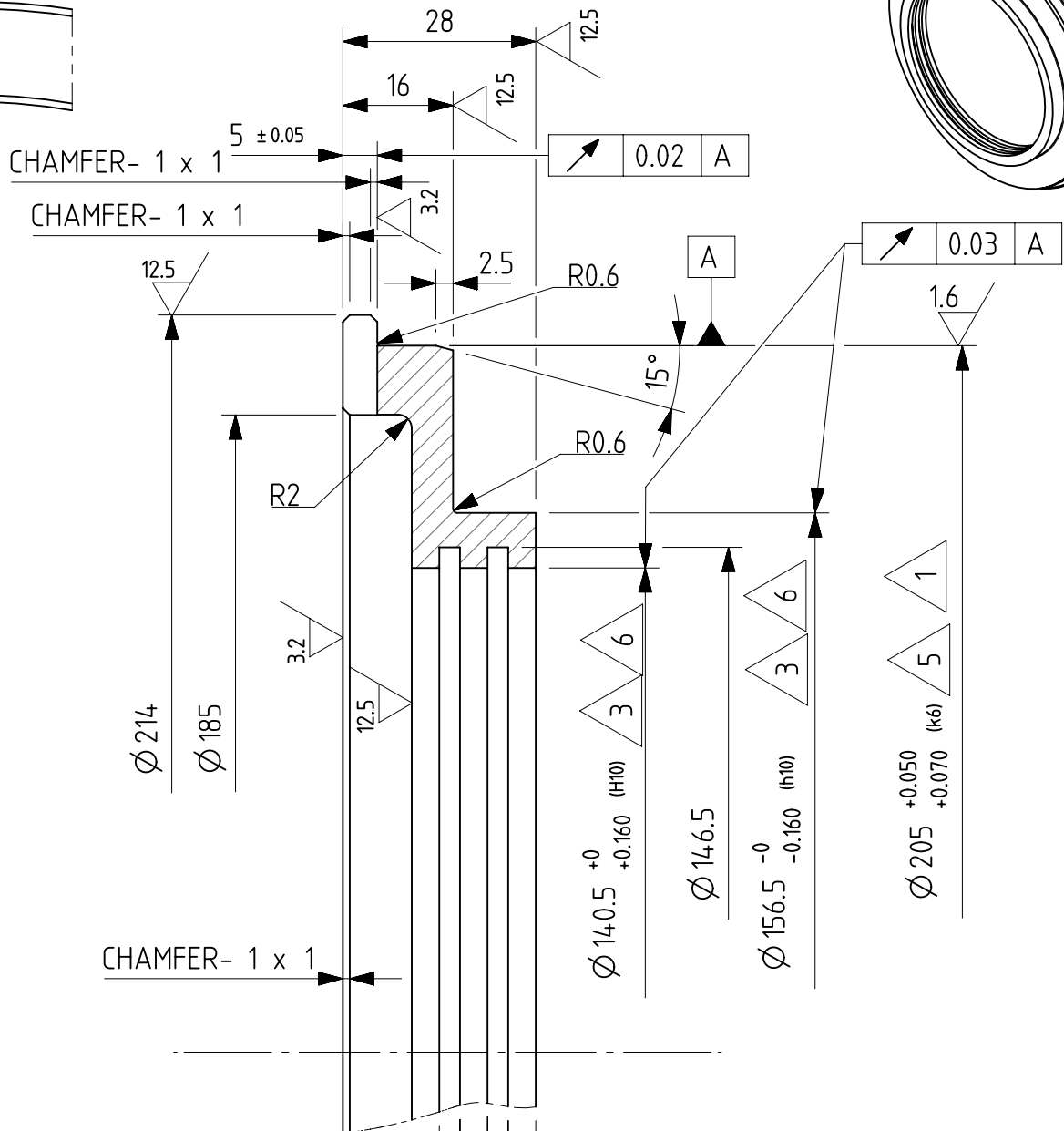
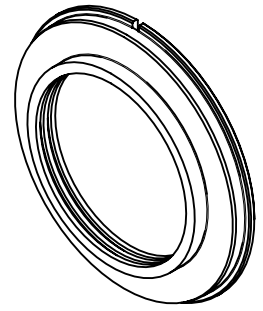
अधिकृत DGN	
जॉचा व.अ. CHD SSE	Ravindra Kumar
समीक्षित स.वि.अ. / व.वि.अ. REVIEWED AEE / SEE	RISHAP CHAUDHARI
अनुमोदित स.यु.वि.अ. APPROVED DYCEE	ANJAN KUMAR
दिनांक DATE	07-08-20



चितरंजन रेलइंजन कारखाना  
CHITTARANJAN LOCOMOTIVE WORKS, INDIA

पदार्थ MATL	SEE NOTE	प्रति भार कि. ग्रा. WT. EACH IN KG	7.4
विशिष्ट SPECN	4TMS.096.068 / LATEST VERSION		
वर्णन DESCRIPTION	OUTER LABYRINTH (DE)		
आरेखण संख्या DRAWING NO.	4TWD.096.029		
परिवर्तन संख्या ALTERATION. NO.	7	पृष्ठ SHEET	1 OF 1
संदर्भ / REF.	3EHM413071	ALT.	A4

Signature Not Verified  
Digitally signed by Ravindra Kumar  
Date: 2022.08.13 13:56:28+05'30'  
Reason: I am PS-CHS  
Location: New Delhi



2. MATERIAL:- SPHEROIDALE GRAPHITE CAST IRON  
(SGCI) TO DIN-1693 PART-1 GR-GGG/40 OR GR-400/18  
OF IS:1865-1991 (LATEST VERSION)

6	DY.CEE /TMD	ALT. 3 WITHDRAWN REF. CLW/TM/18059/PT-1 DTD. 04-07-19	11-07-19
5	DY.CEE /TMD	DRG TOLERANCES ALTEERED V/L NO. CLW/TM/18051 DATED 27-10-152	10-11-12

4	-	REDRAWN IN NX WITH 3RD ANGLE PROJECTION	12-11-09
3	DY.CEE /TMD	DRG. TOLERANCES ALTERED COMPARED TO H.T.M.	18-02-09
2	DY.CEE /TMD	MATL.GRADE & SPECN CHANGED VIDE NOTE NO.CLW/TM/18009. DATED-06.11.2007.NOTE-2 ADDED.	20-11-07
1	DY.CEE /TMD	AGAINST DIMENSION Ø 205 TOLERANCE CORRECTED	03-12-97

अभिकल्पित DGN	
जॉचा व.अ.अ. CHD SSE	Digitally signed by Ravindra Kumar Date: 2020.09.26 12:02:06 +05'30'

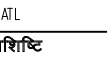


चित्तरंजन रेलइंजन कारखाना  
CHITTARANJAN LOCOMOTIVE WORKS, INDIA

पदार्थ	SEE NOTE	प्रति भार कि. ग्रा.
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परिवर्तन संख्या ALT NO	प्राधिकार AUTHY	वर्णन DESCRIPTION	दिनांकित आधार DATED INITIAL
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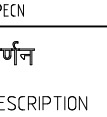
समीक्षित  
स.वि.अ. / व.वि.अ.  
REVIEWED AEE / SEE



4TMS.096.068 / LATEST VERSION

Alt. NO.	REMARKS	INITIAL
सतह - रूखाता का मान मा. मा. 3073 / अ. मा. सं. 1302	अनिर्दिष्ट सच - सीमा मा. मा. : 2102 / अ. मा. सं. : 2768 UNSPECIFIED TOLERANCE TO IS: 2102 / ISO : 2768	TOL. CLS.
SURFACE ROUGHNESS VALUE TO IS:3073 / ISO:1302.	घाटु-वेल्डन चिह्न मा. मा. : 813 / अ. मा. सं. : 2553 WELDING SYMBOLS TO IS:813 / ISO:2553	

<p>अनुमोदित उ.मु.वि.अ.</p> <p>APPROVED DYCEE</p>	<p>Digitally signed by: RANJAN KUMAR PRAMANIK</p> <p>Date: 2023.01.01 13:36:07 +05'30'</p>
<p>दिनांक</p> <p>DATE</p>	<p>07-08-20</p>



### INNER LABYRINTH (NDE)

	सं2	सं3	सं4	सं5	सं6	सं7	सं8	सं9	सं10	सं11	सं12
	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
0.5-0.7	0.9-1.1	1.5-2.0	2.5-3.8	5.0-6.3	9.0-12	16-25	30-40	50-63	75-100	160-250	
0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50	
XXXX			XXXX		XX				XX		XX

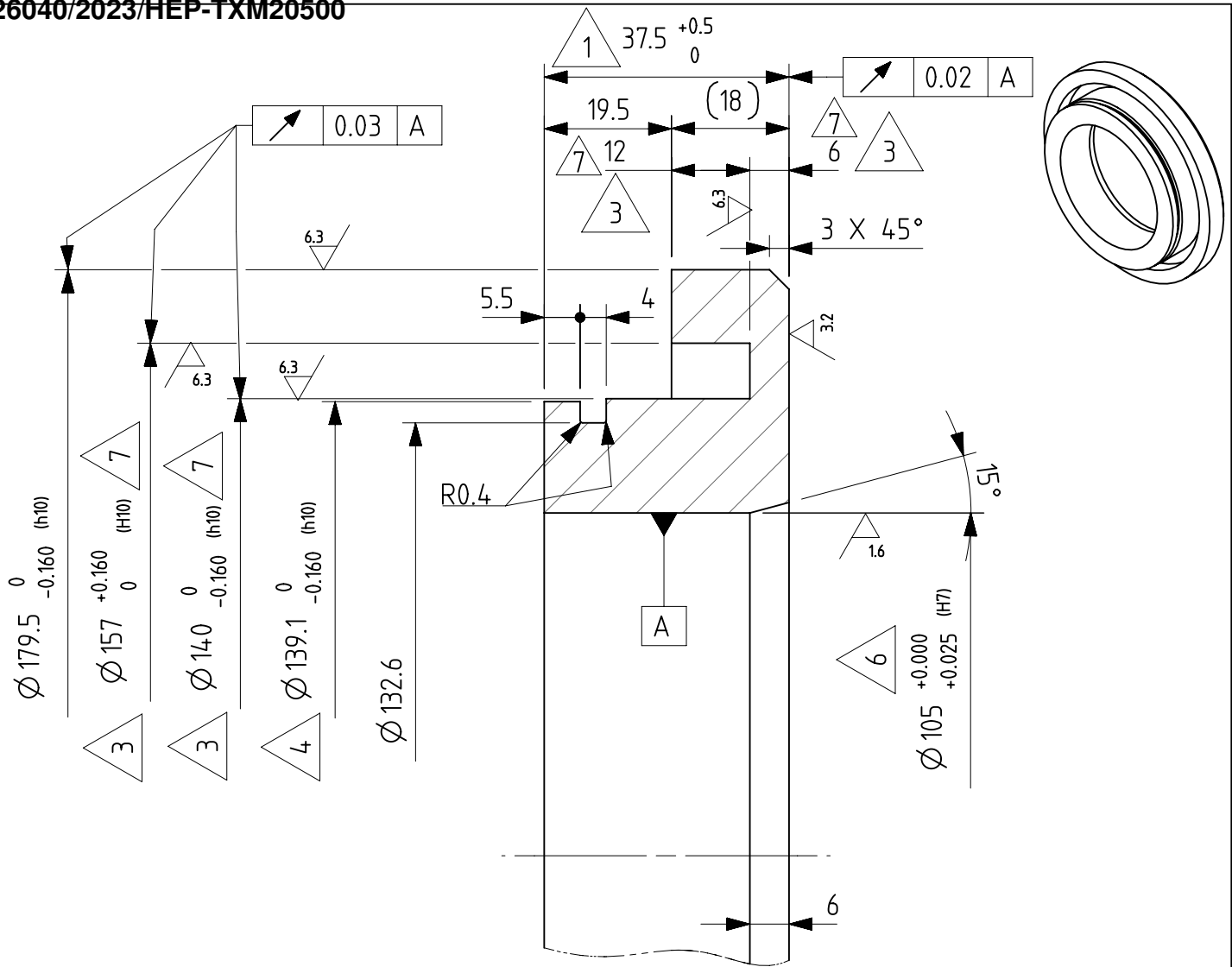
DATE	07-08-20
रैखिक अनुपात SCALE	1:1
संदर्भ / REF. 3EHM412822 ALT.-	



4TWD.096.031

son: IRIPS-CHRIS  
ation: New Delhi

~~1326040/2023/HEP-TXM20500~~



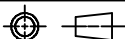


NOTE:-

1. REMOVE ALL SHARP EDGES
2. MATERIAL:- SPHEROIDALE GRAPHITE CAST IRON (SGCI) TO DIN-1693 PART-1 GR-GGG/40 OR GR-400/18 OF IS:1865-1991 (LATEST VERSION)

7	DY.CEE/ TMD	ALT.3 WITHDRAWN REF. CLW/TM/18059/PT-1 DATED 04-07-19	11-07-19
6	DY.CEE/ TMD	TOLERANCES ALTERED V/L NO. CLW/TM/18051 DATED 27.10.12	10.11.12
5	-	REDRAWN IN NX WITH 3RD ANGLE PROJECTION	13-11-09
4	DY.CEE/ TMD	DIMNS ALTERED. DIMNS. $\varnothing 139.1^{+0}_{-0.160}$ WAS $\varnothing 139.6^{+0}_{-0.160}$	14-03-09
3	DY.CEE/ TMD	DRG. TOLERANCES ALTERED COMPARED TO HTM.	18-02-09
2	DY.CEE/ TMD	MATL. GR. & SPECN. CHANGED VIDE NOTE NO. CLW/TM/18009 DATED 06-11-2007. NOTE 2 ADDED.	20-11-07
1	DY.CEE/ TMD	TOLERANCE ON DIMENSION 37.5 INCORPORATED. VIDE EL/TM/3009 DT.17-12-04	22-12-04

C&D NO.-5720/201  
QTY/TM: 1 NO

अधिकल्पित DGN			चिततरंजन रेलइंजन कारखाना CHITTARANJAN LOCOMOTIVE WORKS, INDIA				
जॉचा व.अ.अ. CHD SSE	Ravindra Kumar <small>Digitally signed by Ravindra Kumar DN: c=IN, o=2020.09.20 12:05:36 +05'30'</small>		पदार्थ MATL	SEE NOTE	प्रति भार कि. ग्रा. WT. EACH IN KG		
समीक्षित स.वि.अ. / व.वि.अ. REVIEWED AEE / SEE	RISHAB CHAUDHARI <small>Digitally signed by RISHAB CHAUDHARI DN: c=IN, o=2020.12.29 17:18:58 +05'30'</small>	विशिष्ट SPECN	4TMS.096.068 / LATEST VERSION				
अनुमोदित उ.नु.वि.अ. APPROVED DYCEE	RANJAN KUMAR PRAMANIK <small>Digitally signed by RANJAN KUMAR PRAMANIK DN: c=IN, o=2020.01.22 13:35:51 +05'30'</small>	वर्णन DESCRIPTION	INNER LABYRINTH (NDE)				
दिनांक DATE	07-08-20	आरेखण संख्या DRAWING NO.	4TWD.096.042				
रैखिक अनुपात SCALE	1:1		परिवर्तन संख्या ALTERATION NO.	7	पर्ण SHEET	1 OF 1	A4
संदर्भ / REF. 3EHM412821 ALT.-							

Signature Not Verified

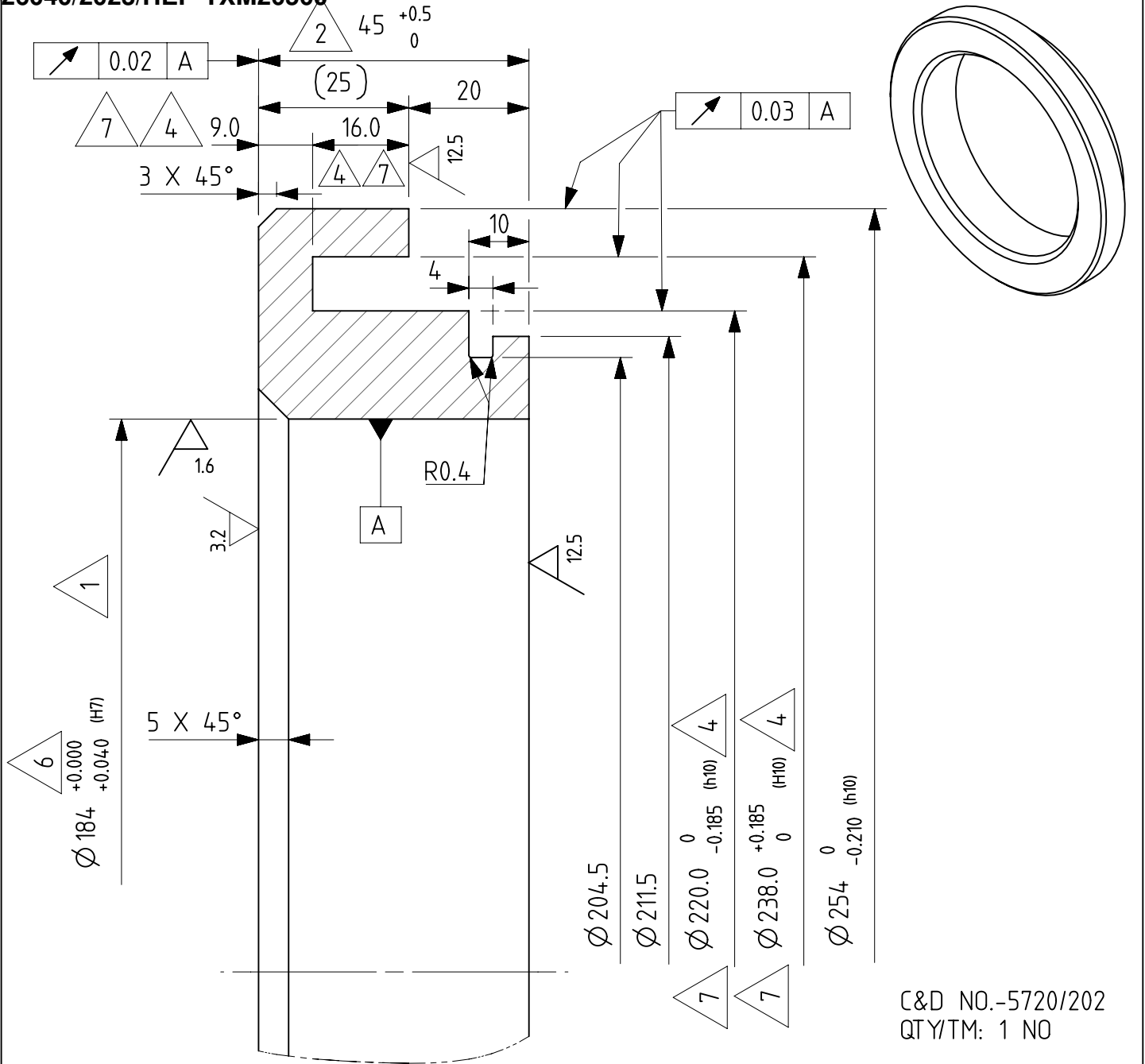
Digitally signed by Ravindra Kumar, DN: cn=Ravindra Kumar, o=IREPS, ou=IREPS, email=Ravindra.Kumar@ireps.org, c=IN, reason=The signature is not valid.

Date: 2022.06.13 13:49:15 +05'30'

Reason: IREPS-CHIS

Location: New Delhi

1326040/2023/HEP-TXM20500

C&D NO.-5720/202  
QTY/TM: 1 NO

NOTE:-

1. REMOVE ALL SHARP EDGES

2. MATERIAL:- SPHEROIDALE GRAPHITE CAST IRON (SGCI) TO DIN-1693 PART-1 GR-GGG/40 OR GR-400/18 OF IS:1865-1991 (LATEST VERSION)

7	DY.CEE/TMD	ALT.4.WITHDRAWN REF. CLWTM/18059 PT-1 DT. 04-07-19	11-07-19
6	DY.CEE/TMD	TOLERANCES ALTERED V/L NO. CLWTM/18051 DATED 27.10.2012	10-11-12
5	-	REDRAWN IN NX WITH 3RD ANGLE PROJECTION	12-11-09
4	DY.CEE/TMD	DRG. TOLERANCES ALTERED COMPARED TO HTM.	20-02-09
3	DY.CEE/TMD	MATL. GR. & SPECN. CHANGED VIDE NOTE NO. CLWTM/18009 DATED 06-11-2007. NOTE 2 ADDED.	20-11-07
2	DY.CEE/TMD	TOLERANCE ON DIMENSION 45 INCORPORATED VIDE EL/TM/3009 DTD.17-12-04	22-12-04
1	DY.CEE/TMD	AGAINST DIMENSION Ø 184(H7) TOLERANCE CORRECTED	02-02-99

परिवर्तन संख्या	प्राधिकार	वर्णन	दिनांक
ALT.NO.	AUTHY	DESCRIPTION	DATED INITIAL
सतह - रूखाता का मान मा. मा. 3073 / अ. मा. सं. 1302	अतिरिक्त सद्य - सीमा मा. मा. : 2102 / अ. मा. सं. : 2768	UNSPECIFIED TOLERANCE TO IS : 2102 / ISO : 2768	TOL. CLS.
SURFACE ROUGHNESS VALUE TO IS:3073 / ISO:1302	धातु-वैलन चिह्न मा. मा. : 813 / अ. मा. सं. : 2553	WELDING SYMBOLS TO IS:813 / ISO:2553	

सं2	सं3	सं4	सं5	सं6	सं7	सं8	सं9	सं10	सं11	सं12
N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
0.5-0.7	0.9-1.1	1.5-2.0	2.5-3.8	5.0-6.3	9.0-12	16-25	30-40	50-63	75-100	160-250
0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50

2. MATERIAL:- SPHEROIDALE GRAPHITE CAST IRON (SGCI) TO DIN-1693 PART-1 GR-GGG/40 OR GR-400/18 OF IS:1865-1991 (LATEST VERSION)														
अधिकृतित DGN		जॉचा व.अ. CHD SSE		समीक्षित स.वि.अ. / व.वि.अ. REVIEWED AEE / SEE		अनुमोदित स.पु.वि.अ. APPROVED DYCEE		दिनांक DATE		रैखिक अनुपात SCALE				
		Ravindra a Kumar		RISHAB CHAUD HARI		RANJAN KUMAR PRAMAN K		07-08-20		1:1				
		Digitally signed by Ravindra Kumar DN: cn=Ravindra Kumar, o=INDIAN RAILWAYS, ou=INDIAN RAILWAYS, email=RAVINDRA.K@IRCTC.GOV.IN, c=IN		Digitally signed by RISHAB CHAUDHARI DN: cn=RISHAB CHAUDHARI, ou=INDIAN RAILWAYS, ou=INDIAN RAILWAYS, email=RISHAB.CHAUDHARI@IRCTC.GOV.IN, c=IN		Digitally signed by RANJAN KUMAR PRAMAN K DN: cn=RANJAN KUMAR PRAMAN K, ou=INDIAN RAILWAYS, ou=INDIAN RAILWAYS, email=RANJAN.K@IRCTC.GOV.IN, c=IN								
				पदार्थ MATL				प्रति भार कि. ग्रा. WT. EACH IN KG						
				विशिष्ट SPECN				4TMS.096.068 / LATEST VERSION				3		
				वर्णन DESCRIPTION				INNER LABYRINTH (DE)						
				आरेखण संख्या DRAWING NO.				4TWD.096.043						
				परिवर्तन संख्या ALTERATION. NO.				7		पर्ण SHEET		1 OF 1		A4

Signature Not Verified  
Digitally signed by Ravindra Kumar  
Date: 2022.08.13 13:58:00 +05'30'  
Reason: IREPS-CHS  
Location: New Delhi



## SPRING LOADED CHECK VALVE



1. MATERIAL: BRASS CuZn40-HB TO IS:410-1977.
2. EACH COMPONENT SUPPLIED SHOULD BEAR A PUNCH MARK OF FIRM AT SUITABLE LOCATION.
3. PACKING - EACH COMPONENT SHALL BE SUITABLY PACKED i.e. WRAPPED BY POLYTHENE PAPER FOLLOWED BY CORRUGATED PAPER AND FINALLY BE SEALED IN A HARD CARD BOARD BOX SO THAT NO DAMAGE CAN ARISE DURING TRANSPORTATION.
4. THIS IS A COMMON DRAWING OF 6FRA-6068 AND 6FXA-7059.  
THE C&D NO. FOR 6FXA-7059 IS 5830/103.

C&D NO.: 5730/302  
QTY/TM: 2 NOS

CHITTARANJAN LOCOMOTIVE WORKS, INDIA											
INDIAN RAILWAYS											
चित्ररंजन रेलइंजन कारखाना											
CHITTARANJAN LOCOMOTIVE WORKS, INDIA											
पदार्थ MATL BRASS CuZn40-HB प्रति भार कि. ग्रा. WT. EACH IN KG											
विशिष्ट SPECN IS:410											
वर्णन DESCRIPTION LUBRICATING NIPPLE											
वर्णन DESCRIPTION											
आरेखण संख्या DRAWING NO. 4TWD.096.074											
परिवर्तन संख्या ALTERATION NO. 3											
पृष्ठ SHEET 1 OF 1											
A4											

Signature Not Verified  
Digitally signed by RAVINDRA KUMAR  
Date: 2023.04.13 17:30:05  
Reason: IREPS-GRIS  
Location: New Delhi