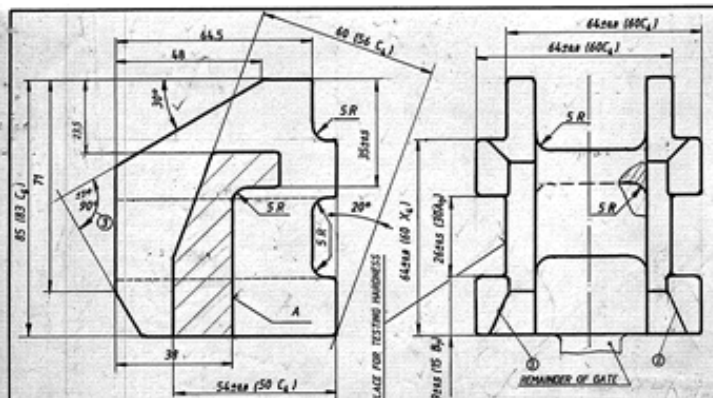

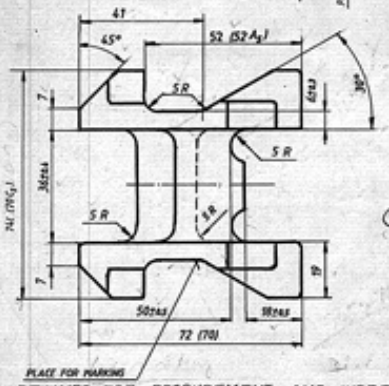

CASTING DRAWING

1. DIMENSIONS ARE IN mm.
2. SCALE :- 1:1
3. FIRST ANGLE PROJECTION
4. HARDNESS AFTER PRELIMINARY HEAT-TREATMENT H/B 269 MAX.
5. UN-SPECIFIED CASTING RADII 2 mm.
6. DRAFT ANGLE AS PER GOST 3212-80.
7. CASTING DEFECTS ON NON-MACHINED SURFACES ARE ALLOWED AS PER GOST 3-6365-79.
8. CORRECTION OF CASTING DEFECTS IS ALLOWED
9. ON SURFACE 'A' NON-FLATNESS IS ALLOWED NOT MORE THAN 0.5 mm.
10. IMPACT STRENGTH SHOULD BE CONTROLLED ON SAMPLES.
11. CLEANING :- SAND BLASTING
12. WEIGHT OF THE CASTING 1.20 Kgs
13. MATERIAL :- 230 COMPLY TY AUN 196-78
14. SPECIAL TEST :- MAGNETIC FLOW DETECTION
15. SURFACE FINISH MAXIMUM.
16. CASTING BELONGS TO GROUP II OST 3-6365-79 (SPECIAL PURPOSE CASTINGS)

CHEMICAL COMPOSITION OF THE MATERIAL AS PER FORM (1)

C	0.20 - 0.24
Si	1.8 - 2.2
Mn	0.5 - 0.8
Cr	0.6 - 0.9
Mo	0.25 - 0.30
V	0.10 - 0.15
S	0.035 MAX.
P	0.025 MAX.
Ni	1.8 MAX.

MECHANICAL PROPERTIES OF THE MATERIAL AS PER FORM (1)

ULTIMATE STRENGTH	140 Kgf/mm²
YIELD STRENGTH	120 Kgf/mm²
RELATIVE ELONGATION	6%
IMPACT STRENGTH	4 Kgm/cm²

MATL: 230 / COMPLY MECH. PROPERTIES
ULTIMATE STRENGTH 130 kgf/mm² AND
YIELD STRENGTH 110 kgf/mm² ARE
ALSO BE ACCEPTABLE

CASTINGS AND TEST BARS ARE SUBJECTED TO FOLLOWING HEAT-TREATMENT :-
a. PRELIMINARY HEAT-TREATMENT (PRIOR TO MACHINING)
i) NORMALISING AT TEMPERATURE 1000° ±20°C FOR 5-2 HOURS.
ii) TEMPERING AT TEMPERATURE 720°±20°C FOR 4 HOURS.
HEAT-TREATMENT AFTER MACHINING FOR TEST BAR ONLY : AS PER FOLLOWING SEQUENCE OF OPN.
HARDENING AT TEMPERATURE 1000°±20°C SOAKING TIME IS ONE HOUR, COOLING IN OIL OF ... TEMPERING AT TEMPERATURE 280°±20°C FOR 4 HOURS.
HEATING FOR NORMALIZING AND HARDENING IS TO BE CARRIED OUT WITH PROTECTION OF CASTINGS FROM DECARBURIZATION AND OXIDATION.

1. ACCEPTANCE OF CASTING IS CARRIED OUT AS PER GOST 977-75 PARAGRAPH TWO AND THREE BUT WHILE MANUFACTURING CASTING AS PER PECHED MODEL AS PER OST 3-6365-79
2. MECHANICAL PROPERTIES OF STEEL IS DETERMINED ON THE SPECIMENS, CUT FROM THE TEST BARS AS PER GOST 977-75 AFTER CARRYING OUT COMPLETE HEAT-TREATMENT PROCESS.
3. TENSILE TEST IS CARRIED OUT AS PER GOST 1497-73 ON CYLINDRICAL SPECIMEN WITH DIAMETER 10 mm WITH LENGTH 50 mm., TESTS ON SPECIMENS (SAMPLES) IN 5 mm DIAMETER WITH 25 mm LENGTH IS PERMITTED
4. DETERMINATION OF IMPACT STRENGTH IS CARRIED OUT AS PER GOST 9454-78 ON THE SPECIMEN OF TYPE 1 AT NORMAL TEMPERATURE AND AS PER GOST 9454-78 AT LOW TEMPERATURE

WBI: MATL. AND RADIOGRAPHIC TEST ADDED IN SHEET NO 2
SHEETS: 1/2

RETEST FOR MATERIAL ONLY AS PER LAST DC (1) No. / LETTER No. MGA-3/TS/Gde/Std:97

C	DA NO. 007/95 DT. 8-2-95		
B	DRG. REVISED TO G3		
A	DRG. VIEW CORRECTED		
1	STORE DRG. NO ADDED		
SL. NO	AMENDMENTS	DA & DATE	

FOR COMPONENT NO 2A42-05-033 - CARRIAGE

10/10/88		08-88			ORDNANCE FACTORY TIRUCHIRAPALLI-16
REDRAWN	CHECKED	APPROVED	F/M. PROJ	A.W.M./PROJ.	DRG NO: 64 C 5033 250 G3

GUIDE LINES FOR PROCUREMENT AND INSPECTION OF INVESTMENT CASTINGS REF: CONTROLLERATE OF QUALITY ASSURANCE (METALS) ICHAPUR LETTER NO MGA-1/GA/11.2 DT. 05 MAY 1988

ALB.NO.387; SHEET NO.1

05-033

INDIGENOUS MATERIAL

IS:10343 Gr 4D OR B:3146 PT.I-74, TYPE CLA-5 GRADE 'B' IS-10343-Gr 4D: CASTING TO BE HEAT-TREATED TO ACHIEVE 41.5-51.5 HRC SEPARATELY CAST TEST BARS SHALL MEET THE SPECIFIED MECH. PROPERTIES INCLUDING IZOD IMPACT VALUE 14J/ MIN.

OR

~~BS: 3146 Pt.I: 1974, TYPE CLA-5 GRADE 'B'~~

RADIOGRAPHIC TEST

(a) RADIOGRAPHIC ACCEPTANCE STANDARD OF THE CASTING SHOULD BE AS PER RSTM-E-192

(b) 100% OF THE ADVANCE SAMPLE (NOT LESS THAN 5) WILL BE SUBJECTED TO RADIOGRAPHIC TEST.

(c) RADIOGRAPHIC TEST OF ADVANCE SAMPLE WILL BE CARRIED OUT BY CQA(MET) ICHAPUR.

OR

THE AREA QUALITY ASSURANCE OFFICER CONCERNED WOULD GET THE RADIOGRAPHIC TEST DONE IN HIS PRESENCE AND FORWARD THE PLATES TO CQA (MET) ICHAPUR FOR SENTENCE AND APPROVAL OF THE MOULD.

(d) BULK PRODUCTION WOULD COMMENCE ONLY AFTER MOULD AND MATERIAL HAS BEEN APPROVED BY CQA(MET) ICHAPUR.

(e) 5% OF THE CASTING SELECTED AT RANDOM FROM THE BULK WOULD BE SUBJECTED TO RADIOGRAPHIC TEST. THIS MAY BE DONE UNDER THE ARRANGEMENT OF THE AREA QUALITY ASSURANCE OFFICER AND SENTENCE MAY BE AWARDED BY HIM BASED ON THE STANDARD OF THE ADVANCE SAMPLES CLEARED BY CQA(MET) ICHAPUR.

REF :- CONTROLLERATE OF QUALITY ASSU(M) JABALPUR LETTER NO. 50431/CQAM/DA-11 DATED 14 MARCH 95.
CONTROLLERATE OF QUALITY ASSU (M) ICHAPUR L.NO. MGA-3/LIN/3/M DT 03 MAY 1995

INDIGENOUS MATERIAL, IS-10343 Gr 4B WITH C.T. 0.45-0.50 AND MECHANICAL PROPERTIES AS SPECIFIED IN SPECIFICATION FOR THE GRADE
AUTHORITY : CQA (METALS) ICHAPUR LTR NO. MGA-3/TS/B DT. 21-6-1997

IS:10343-1999, GDE 18Q

G DA No.003/16 Dt.26.02.16

F	DA No. 044/97 Dt. 24-6-97	25/6/97
E	DA NO. 10/98 Dt. 21/1/98	
D	DA. 080/08 Dt. 01-4-98	

AMENDMENTS	DESCRIPTIONS	DRG. & DATE
SHEET 2/2	APPROVED	ORDNANCE FACTORY TIRUCHIRAPALLI
DRAWN	CHECKED	I/C. 30mm D&DO

COMPONENT NO. 2A42-05-033 CARRIAGE
DRG. NO. 64C 5033250 G3