Specification No. IND/GS/1913

This Specification supersede Specification No. RDEE/ENGR/SPCN/0193

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DT 28/12/2021
(Bijender Kumar)
JAE(NTS)
DC(GS)3

GOVERNMENT OF INDIA
MINISTRY OF DEFENCE
DGQA ORGANISATION

HAMMER PITON
FOR
(GLACIER & HIGH ALTITUDE AREA)

DS Cat Part No – A3/5120-423036
NSN: 512072 0411621

ISSUED BY

THE CONTROLLER
CONTROLLERATE OF QUALITY ASSURANCE (GENERAL STORES)
DEPTT. OF DEFENCE PRODUCTION, MINISTRY OF DEFENCE
DGQA STORES COMPLEX, ASHOK PATH
KANPUR - 208 004

Year: 2021

RECORD OF AMENDMENTS

Amendment Sheet No.	Date	Details of Amendments	Amendment Carried out by & date

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0.0 FOREWORD

0.1 This Specification has been prepared by Controllerate of Quality Assurance (General Stores), Ashok Path, DGQA Complex, Kanpur – 208004 on behalf of Directorate General of Quality Assurance, Ministry of Defence, New Delhi.

0.2 This Specification has been formulated on the basis of R & D Engrs, Pune Specification No. **RDEE/ENGR/SPCN/0193**

0.3 The Quality Assurance authority for the store covered by this specification is the Controller. Controllerate of Quality Assurance (General Stores), Ashok Path, DGQA Complex, Kanpur – 208004. Enquiries regarding this specification related to technical or any other contractual conditions shall be referred to the Quality Assurance authority named in the purchase documents viz. tender or contract.

0.4 The specification is a live document and is therefore, likely to undergo changes. Any major change in design should have the approval of General Staff/Users, financial concurrence in the form of DGQA approval. Thus, it may involve some price difference. Therefore, a specification issued holds good only for the supply order for which it is issued

IS Series	The Director General Bureau of Indian Standards, Manak Bhavan, 9, Bahadur Shah Zafar Marg, New Delhi-110002 Or its regional office / Branch Office.
IND/GS/Series & CQA/GS/SS Series	The Controller Controllerate of Quality Assurance (GS), Ashok Path, Kanpur - 208004
JSS Series	The Director, Directorate of Standardisation, Standardisation Document Centre, Ministry of Defence, Room No 5, 'J' Block, Nirman Bhawan PO, New Delhi - 110011

1 SCOPE

This Specification provides guidance to Contractors/ Suppliers, Manufactures, Quality Assurance Agencies and stockiest/indenters etc. for the materials, fabrication, manufacture, heat-treatment workmanship, testing and packing for Hammer Piton for Glacier and high altitude areas.

2. RELATED SPECIFICATION

S. No.	Specification	Nomenclature
a)	IS : 1572	Electroplated coating of cadmium on iron or steel
b)	IS : 1068	Electroplated coating of Nickel plus Chromium and Copper plus Nickel plus Chromium
c)	IS : 1757	Method for beam impact test (V notch) on steel
d)	ASTM Standard Vol. 3	Stainless steel 304 & 316
e)	Defence standard DEF-STAN – 10 – 13/2	Special steel produced by Mishra Dhatu Nigam Ltd., Hyderabad
f)	Proprietory MDN -72	Special steel produced by Mishra Dhatu Nigam Ltd., Hyderabad
g)	IS 2500 (Part 1) : 2000 (Third Rev) Amd 2 (RA 2016)	Sampling Procedure for Inspection by Attributes
h)	IS 4905: 2015 OR ISO 24153 :2009	Method of Random Sampling
i)	IS:3962 and SS No CQA(GS)/SS/361(d)	Wax Coated Paper for wrapping
j)	IS 2102 (Medium class)	Tolerance for dimensions of the components

3 STANDARD PATTERN

3.1 Standard pattern of Hammer Piton by this specification is required for glacier & high altitude areas. It is used for hammering of pitons into rock or ice during climbing operations. It consists of head, locking strip, handle and thong. The nominal length of the handle is 270 mm and the maximum weight of the hammer including handle is 575 gms

3.2 Standard pattern held by the purchase officer shall constituted the standard as regard any particular or properties not noted or defined in this specification.

4 MATERIAL

Hammer Piton – Head and locking strip shall be made of special cold resistant steel MDN 172 or C-55 as per DEF-STAN – 10 – 13/2. Handle shall be made of seasoned Dhawda wood. Thong is to be made of braided nylon rope of 6 mm dia. suitable for use under sub-zero temperature conditions.

5 MANUFACTURING

5.1 The Hammer Piton shall be manufactured by adopting the procedures narrated below.

5.1.1 **Head** – Head shall be made from cold resistant steel MDN 172 or C-55 as per DEF-STAN – 10 – 13/2 by forging and machining using the following operations as mentioned in the preceding paragraphs. Identification of hammer piton shall be legibly stamped/ marked at a suitable place with manufacture's name, recognised trade mark during forging.

(a) Blanking
(b) Forging
(c) Trimming
(d) Milling
(e) Drilling
(f) Heat treatment
(g) Shot blasting
(h) Cadmium coating

5.1.2 **Locking Strip** – Locking strip shall be made from sheets of steel C-55/MDN – 172 by machining.

5.1.3 **Rivet** – Rivet shall be made from round bar of stainless steel 304 or 316 by machining.

5.1.4 **Handle** – Handle shall be made from seasoned Dhawda wood. The seasoning of Dhawda wood has been described in this specification separately.

5.1.5 **Thong** – Nylon rope of 6 mm dia with a minimum breaking strength of 1000N shall be used to prepare the thong.

5.1.6 **Heat Treatment** – The Hammer Heads made of special steel C-55/MDN172 shall be subjected to heat treatment after forging and machining.

5.1.7 **Tempering** – Tempering cycle shall start as early as possible after the temperature of forged heads come down to 80 deg. C. However, in no case, the forgings shall be allowed to dwell in room temperature for more than 4 hours. The forgings shall be charged into furnace with 350 to 400 deg. C temperature which shall be maintained for four hours. After soaking the forged heads at that temperature for two hours the temperature of the furnace shall be raised to 650 deg. C uniformly in four hours. The soaking period at 650 deg. C shall be four hours minimum. After this the forgings shall be removed from the furnace and allowed to cool in the air at ambient atmosphere.

5.1.8 **Forging Temperature** – The forging temperature shall be restricted to 1150 deg. C. When the reduction of the job is 25% or less, the finishing temperature shall be around 1100 deg. C. After the final forging of the components, the same shall be sand cooled to room temp. from 650 deg. C.

5.1.9 **Hardening** – After machining, heads shall be placed in furnace at a temperature of 400 deg. C and kept there for two hours minimum. The temperature then shall be increased to 860 deg. C +0 - 10 deg. C as for as possible. The soaking period at this temperature shall be two hours and the heads shall then be removed from the furnace and immediately quenched in oil bath. Temperature of the oil bath shall be maintained at 80 deg. C minimum. Any industrial oil may be used for quenching. The **Hardness of the heads after heat treatment shall be within the range of 350 to 400 HV.**

5.1.10 **Crack Detection test** - All components shall be subjected to crack detection test before plating by adopting any of the non – destructive test method.

5.1.11 **Cadmium coating**- As per Specification IS:1572.

5.1.12 **Treatment of Dhawda Wood** – The seasoning of Dhawda wood shall be done in two stages:

(a) **Chemical Treatment** – Chemical pre-seasoning treatment is required to avoid the occurrence of hair cracks in the timber. The timber is required to be dipped in solution of 60% urea and kept there for two hours.

(b) **Seasoning** – The timber, after the chemical treatment shall be properly seasoned in kiln and its moisture content shall be in the range of 12 to 15% (preferably 14%).

After finishing the handle with the seasoned wood the same should be thoroughly soaked in hot (about 90 deg. C) linseed oil for one hour. The handles then shall be wiped clean with a dry piece of cloth. It will be preferable to have polythene coating on the finished handles instead of linseed oil coating.

6. WORKMANSHIP AND FINISH

The general workmanship and finish shall be of a high standard and similar to equipment available in the developed countries. The equipment shall be free from dents, burrs, cracks, excess material or any other harmful defects.

7. DIMENSIONS, TOLERANCES & TESTS

7.1 **DIMENSIONS** - The store shall conform to the dimension shown in the plate attached to this specification.

7.2 **TOLERANCE CLASS** - Unless otherwise specified, general tolerances on dimension of the components shall confirm to medium class as per IS: 2102.

7.3 TEST METHODS

7.3.1 Physical tests: Design, shape and dimensions.

7.3.2 Chemical tests: Chemical analysis, thickness/amount of plating/coating.

7.3.3 Plating: The plating shall satisfy the test requirement as stipulated in IS:1572–1986 (RA 2016).

7.3.4 Impact test: Sample test pieces (3 Nos) from each lot of special steel C-55/MDN172 shall be prepared for charpy 'V' notch impact test as per IS-1757 and shall be subjected to same cycle of heat – treatment along with the components. When these samples are subjected to impact test at minus 40 deg. C after heat-treatment the same should yield 27 J (20 ft lbs) minimum value.

7.3.5 Hardness test: The samples shall be tested for their hardness which shall be within the range 350 to 400 HV.

7.3.6 Crack Detection test: All components shall be subjected to crack detection test before plating by adopting any of the non – destructive test method.

7.3.7. Environmental test: CVN value of the test pieces at minus 40 deg. C.

7.3.8. Functional test: Hammer (5 Nos) kept in the environmental chamber at minus 40 deg. C, when taken out and hit on pitons shall not break or develop cracks. Detection of cracks in all hammers in each lot.

7.3.9. Weight: Assembled hammer is 575 gms max.

8. PRE-INSPECTION OF THE STORE

8.1 Manufacturers/Contractors must satisfy themselves first that the store manufactured is in accordance with the contract and fully conform to the specification by carrying out thorough pre-inspection of each lot before actually tendering the same for inspection to the Quality Assurance Officer nominated under the terms of the contract.

8.2 A declaration given by the contractor that necessary pre-inspection test have been carried out on the stores tendered and the same are fit for inspection and test, shall be tendered along with the challan. The declaration shall include the method followed in pre-inspection showing features checked/tested and will have the test report attached to the challan. If the QA Officer finds that pre-inspection of the consignment as required above has not been carried out the consignment is liable for rejection.

9 QUALITY ASSURANCE

9.1 The Equipment Hammer Piton shall be tendered for Inspection in a neat and clean condition.

9.2 Examination of the samples taken from any portion of the consignment or during surveillance inspection shall conform to the requirement when tested in accordance with the methods mentioned against each referred in this specification.

10 SAMPLING

10.1 Formation of Lot - The delivery shall be visually inspected by the Quality Assurance Officer at the spot in first instance to ascertain the homogeneity in respect of nature, size, shape, source and year of manufacture. If the lot is homogeneous, the delivery shall be treated as one lot. If not, it shall be segregated by the supplier into separate groups so that each group which is homogeneous within itself forms a lot.

10.2 The supplier shall arrange the units of the homogeneous lot in such a way that all the units are easily accessible to the Quality Assurance Officer to enable him to draw samples from any portion of the homogeneous lot.

10.3 Sampling Procedure - Sampling of stores shall be done by adopting appropriate sampling method as per IS 4905: 2015. Samples drawn as per Table–I for assessing various quality requirements and to be truly representative of the lot.

10.4 Scale of Sampling - The number of sample units to be drawn for assessing the quality of the store, characteristic-wise, should be in accordance with Table–I dimensional/non-destructive/visual inspection and laboratory testing as given below:

SAMPLING PLAN AQL 4% FOR VISUAL, DIMENSIONAL INSPECTION AND LABORATORY TESTING

Table I

Lot Size	For Visual, Dimensional Examination		Samples For Laboratory Testing			
			For Physical Testing (S–4)		For Chemical Testing (S-1)	
	Sample Size (n)	Acceptance Number (a)	Sample Size (n)	Acceptance Number (a)	Sample Size (n)	Acceptance Number (a)
1	2	3	4	5	6	7
Up to 50	8	0	5	0	2	0
51 to 90	13	1	5	0	3	0
91 to 150	20	2	8	1	3	0
151 to 280	32	3	13	1	3	0
281 to 500	50	5	13	1	3	0
501 to 1200	80	7	20	2	5	0
1201 to 3200	125	10	32	3	5	0
3201 to 10000	200	14	32	3	5	0
10001 to 35000	315	21	50	5	5	0

NOTE:

1. When the sample size equals or exceeds lot size, do 100 % inspection with zero acceptance number to carried out
2. Rejection number will always be one more than the acceptance number.
3. SOURCE – IS 2500(Part 1) (Sampling inspecting procedure) Part 1 attribute sampling plan index by Acceptable Quality level (AQL) for lot by lot in inspection.
4. The above is for guidance to manufacture, Acceptance criteria will rest on conformity of finished product to specification.

10.5 Sampling for visual Inspection - The Quality Assurance Officer shall draw samples as per Table I for dimensional/non-destructive/visual inspection to assess the quality of the lot. If the quality of the lot indicates conformity to the standard as laid down in Table I above, sampling for laboratory test will be drawn. Otherwise the lot shall be rejected straightway.

10.6 Sampling for laboratory testing - Sampling for laboratory testing shall be carried out as per Table I and the samples shall be subjected to the laboratory testing. If the lot size is more than 35,000 Nos then IS 2500 (part 1) latest (sampling inspection procedures) shall be applied.

11 BULK INSPECTION

If the laboratory test report indicates that the lot does not conform to the standards as specified in Table-I, the whole lot shall be rejected. Otherwise the lot shall be inspected hundred percent thoroughly for workmanship, finish and other critical and visual defects. All items found defective shall be rejected.

12 CRITERIA FOR CONFORMITY

12.1 All the sample units drawn shall be tested/examined to the requirements of relevant specification. If all the samples units are found conform to the requirements of this specification, the supply would be considered to be in conformity otherwise not.

12.2 The lot shall be considered conforming to the specified quality, if the number of defective units observed in the samples is not more than the respective acceptance number for each class of defects.

13 MARKING

13.1 Marking by the supplier - The stores and its components (when demanded separately) shall be clearly and legibly stamped with the following markings:

a) Manufacturer's Name, initials or recognized Trade mark.
b) Year of manufacturing.
c) DS Cat No. and Nomenclature of store.

13.2 Marking by the QA Officer - Each accepted store shall be legibly and indelibly marked using steel stamp, depending upon the size of the store/components.

In case of small components, where stamping is not possible, the acceptance mark shall be stamped on individual package containing the items for his purpose, each package shall be sealed by a continuous piece of adhesive tape such that ends over lap each other. Acceptance marks shall be affixed on the joint of the tape and partly covering the package.

14 WARRANTY

Except as otherwise provided in the invitation to the tender, the contractor/seller hereby declares that the stores, sold/supplied to the purchaser under this contract shall be of the best quality and workmanship and new in all respect and shall be strictly in accordance with the specifications and particulars contained /mentioned in the contract. The contractor /seller hereby guarantee that the said stores would continue to conform to the description and quality aforesaid for period of twelve months from the date of delivery of the said stores to the purchaser or 15 months from the date of

shipment /dispatch from the contractors works whichever is earlier notwithstanding the fact that the purchaser (QA Agency) may have inspected and / or approved the said stores. If during the aforesaid period of 12 /15 months the said stores, be discovered not to conform to the description and quality aforesaid or not giving satisfactory performance or have deteriorated and the decision of the purchaser in the behalf shall be final and binding on the contractor/seller to rectify/replace by acceptable stores, or such portion or portions thereof as is found to be defective by the purchaser in his discretion on the application made thereof by the contractor/seller. In such an event the above mentioned warranty period shall apply to the stores rectified/replaced from the date of rectification/replacement thereof, otherwise the contractor/seller shall pay to the purchaser such compensations as determined by the purchaser as may arise by reason of the breach of the warranty there in contained.

15 PACKAGING

15.1 Method of Packing - The store shall be delivered in a new and clean condition free from all traces of rust and foreign deposition.

15.2 The finished Hammers with identification marks shall be securely packed after applying coating of accepting preservative to be decided in consultation with the Inspecting Authority separately with best trade practices acceptable to QAO by wrapped in wax coated paper. 20 Nos Hammers shall be packed in corrugated boxes. The size of the cotton/Boxes shall be decided depending on the total volume of hammers to be packed in each case. Each box shall be suitably sealed by adhesive tape.

15.3 The box shall then be labeled at front side of the box. These labels shall bear the following markings:

a) DS Cat No./NSN and nomenclature of the stores.
b) Manufacturers name, initials or recognized trade mark.
c) Month and year of packing.
d) Quantity packed preceded by abbreviation QTY.

15.4 The labels after being affixed shall be coated with Varnish, Shellac to give water- proof finish.

15.5 Each Box shall be strapped with Polypropylene strapping, widthwise at two places. The gross mass of the cases wood packing with control shall not exceed 40 kg. In order to maintain the limit of mass, the number of items in the package may be altered at the discretion of the SQAO.

OR

15.6 As per best trade packing (environmental friendly packing) duly approved by concerned SQAE.

16 MARKING ON PACKAGES

The seller shall mark each final package with legibly and indelibly paint/ink in the English language as follows:

a) DS Cat No. and nomenclature of the store.
b) Contract NO. and date
c) Name & address of the consignee
d) Depot/destination
e) Name of Seller
f) Package No.
g) Quantity per package
h) Seller Marking
j) I/Note No. and date

17. DRAWING:- Drawing attached with Specification.(Total 06 sheets)

18. SUGGESTIONS AND IMPROVEMENT - This Specification is a live document and subject to change/updating any suggestion to improve this specification may be addressed to:-

THE CONTROLLER
CONTROLLERATE OF QUALITY ASSURANCE (GENERAL STORES)
DEPTT. OF DEFENCE PRODUCTION, MINISTRY OF DEFENCE
DGQA STORES COMPLEX, ASHOK PATH
KANPUR - 208 004

Recommended
14/12/21
बिजेन्द्र कुमार, रक्षा लेखा नि
BIJENDRA KUM
जे ए जी/एन
उप नियंत्रक / Dy Cont
गु0आ0नि0(सा0व0),कानपुर
रक्षा मंत्रालय / Min. of
अशोक पथ, कैण्ट, कानपुर / Ashok

Approved By
15/12/21
OFFG. CONTROLLER

4 | 3 | 2 | 1

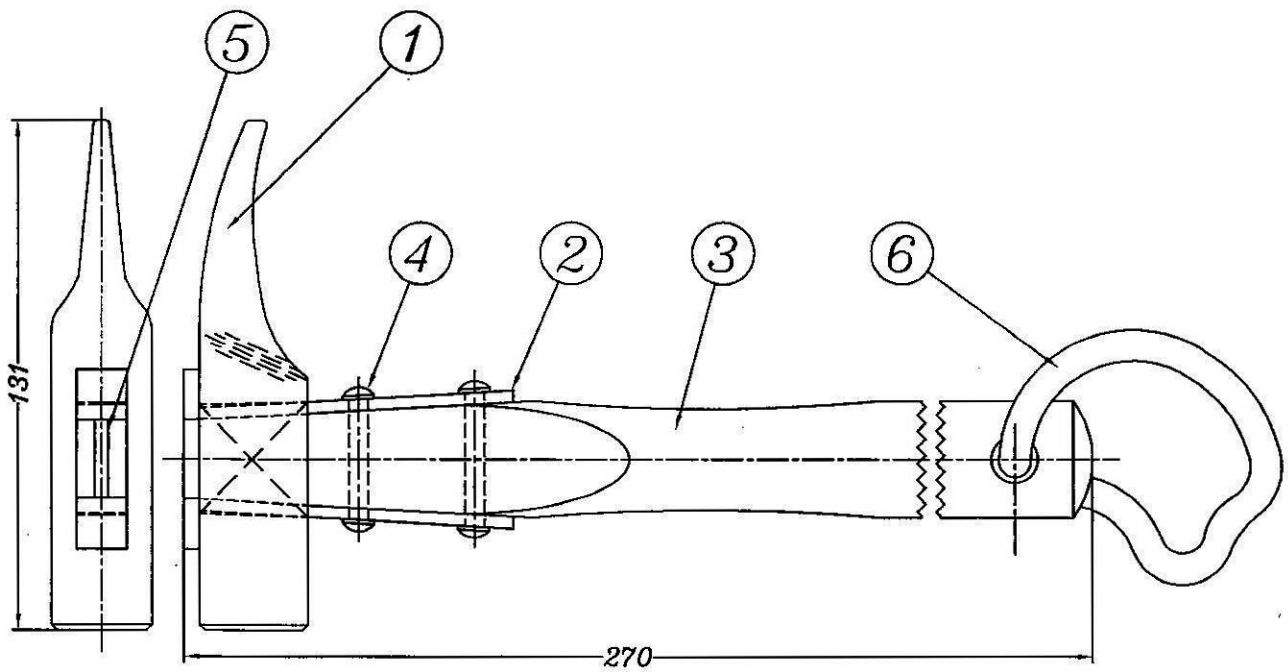
D

C

B

A

HANDLE
(HAMMER PITON)

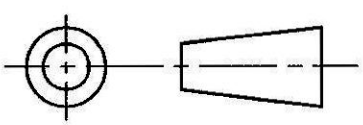


PART LIST			
SEET No.	DETAIL No.	DESCRIPTION	QTY.
4.	1	HEAD	1
1.	2	LOCKING STRIP	2
5.	3	HANDLE	1
2.	4	PIN	2
3.	5	WEDGE	1
6.	–	ASSEMBLY	–
–	6	NYLON ROPE Ø8	500 Lg.

		DATE	NAME
(P.D.ARYA) JTO (D)	DGN.		
	R.DRN.		P D ARYA
	CHD.		P D ARYA
PASSED BY:– GO/GS–2	TRD.		
	COMP.		
APPROVED BY:– DC/GS–2	SCALE : – – –		

HAMMER PITON

CQA (GS)
MINISTRY OF DEFENCE(DGQA)
KANPUR



ALL DIMENSIONS ARE IN mm

PLATE. ATTACHED TO SPECN. NO. IND/GS/1913

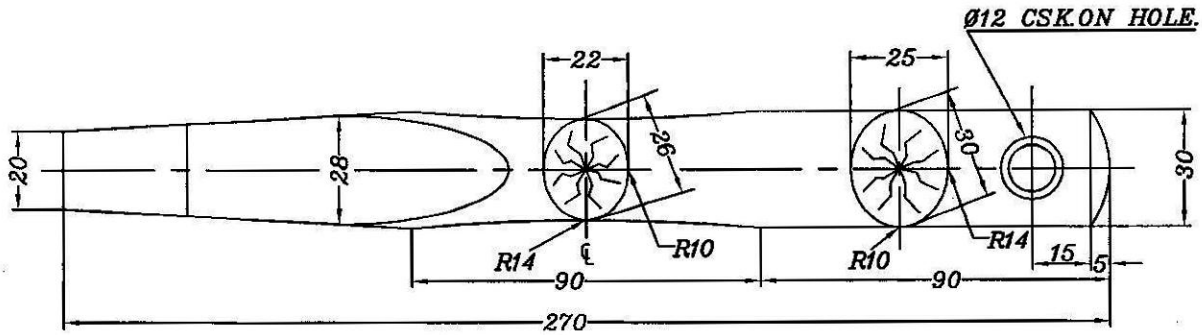
GS–9/81/2021

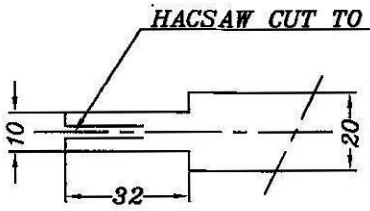
4 | 3 | 2 | 1

D | C | B | A

HANDLE (HAMMER PITON)

③





DESIGNATION	SIZE
DHAWADA WOOD 40 X 30	300 Lg.

(P.D.ARYA)
JTO (D)

	DATE	NAME
DGN.		
DRN.		P D ARYA
CHD.		P D ARYA
TRD.		
COMP.		

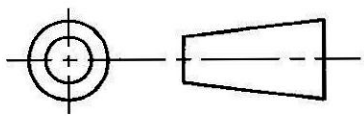
PASSED BY:-
GO/GS-2

SCALE : - - -

APPROVED BY:-
DC/GS-2

HAMMER PITON

CQA (GS)
MINISTRY OF DEFENCE(DGQA)
KANPUR



ALL DIMENSIONS ARE IN mm

PLATE. ATTACHED TO SPECN. NO. IND/GS/1913

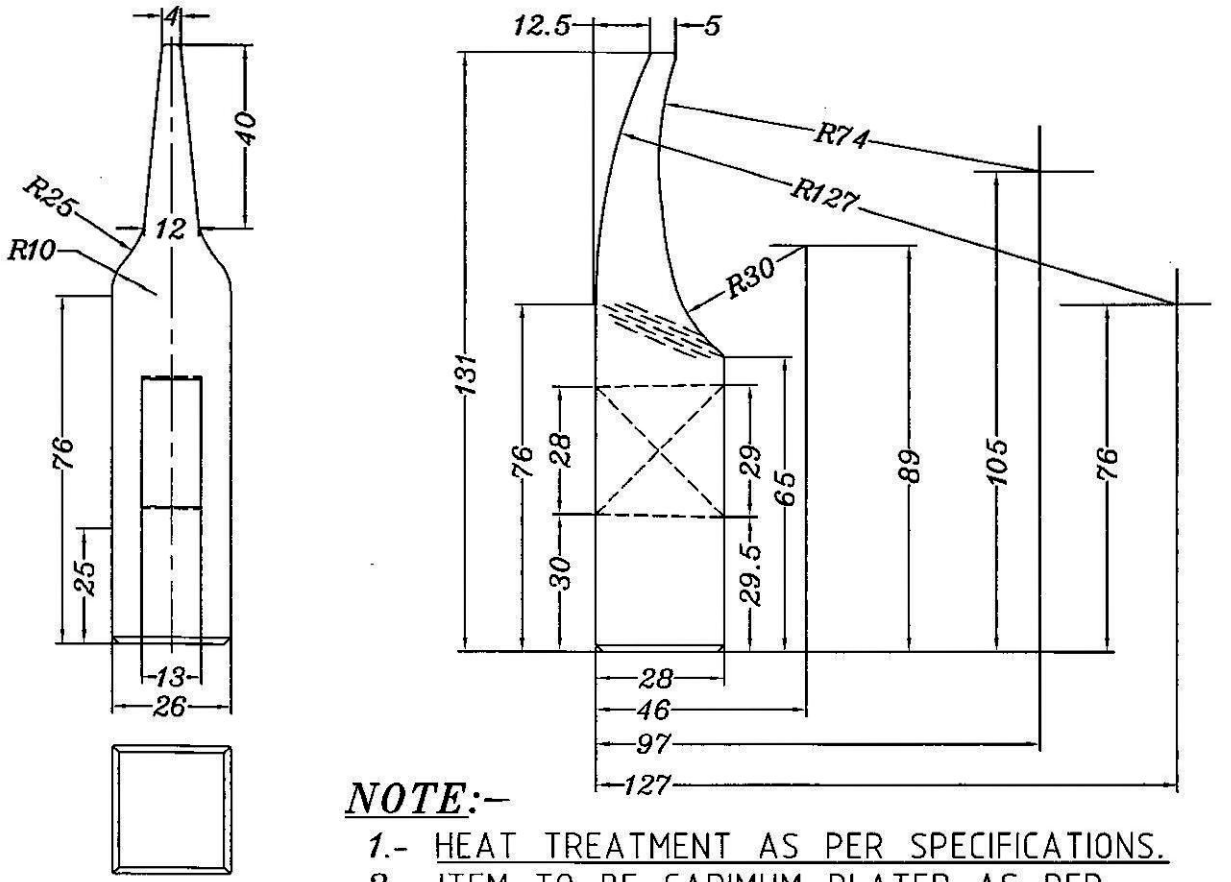
GS-9/81/2021

4 | 3 | 2 | 1

D | C | B | A

HEAD
(HAMMER PITON)

(1)



NOTE:–

1.- HEAT TREATMENT AS PER SPECIFICATIONS.
2.- ITEM TO BE CADIMUM PLATED AS PER IS:572-1960 DEPTH OF COATING AS PER TABLE.
3.- NET WEIGHT SHALL BE 160 Grm. APPROX ALL SHARP EDGES TO BE ROUNDED OFF.

DESIGNATION	SIZE
STEEL C–55/MDN–172 AS PER DEF–STAN– 10–13/2	26X26X131

	DATE	NAME
DGN.		
DRN.		P D ARYA
CHD.		P D ARYA
TRD.		
COMP.		

(P.D.ARYA)
JTO (D)

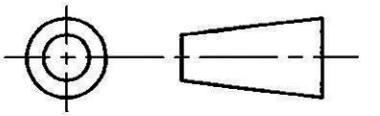
PASSED BY:–
GO/GS–2

APPROVED BY:–
DC/GS–2

SCALE : – – –

HAMMER PITON

CQA (GS)
MINISTRY OF DEFENCE(DGQA)
KANPUR



ALL DIMENSIONS ARE IN mm

PLATE. ATTACHED TO SPECN. NO. IND/GS/1913

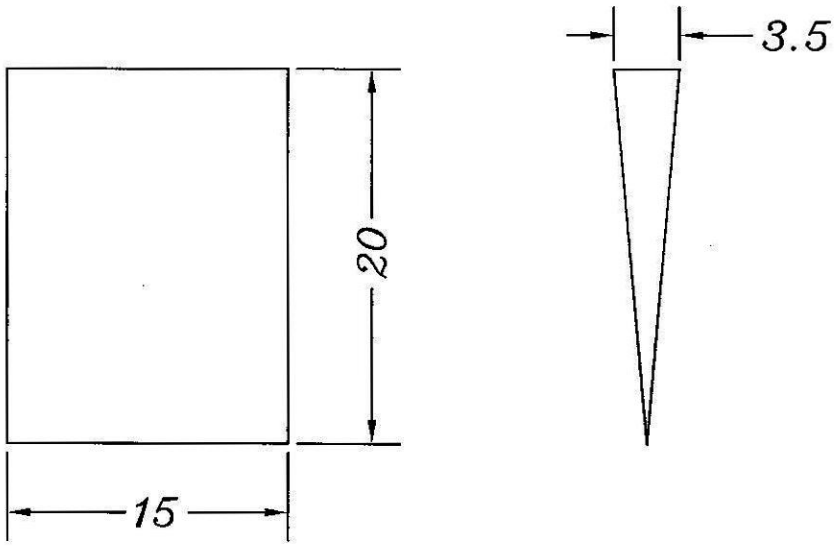
GS–9/81/2021

4 | 3 | 2 | 1

D | C | B | A

(5)

WEDGE



NOTE:-

1.- ITEM TO BE CADMIUM PLATED AS PER IS:1572 - 1968
DEPTH OF COATING AS PER TABLE

DESIGNATION	SIZE
STEEL CONFORMING TO GRD C-55/MDN-172	15 X 20

	DATE	NAME
DGN.		
DRN.		P D ARYA
CHD.		P D ARYA
TRD.		
COMP		

(P.D.ARYA)
JTO (D)

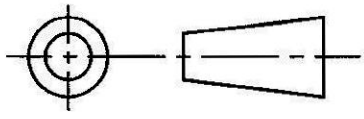
PASSED BY:-
GO/GS-2

APPROVED BY:-
DC/GS-2

SCALE : - - -

HAMMER PITON

CQA (GS)
MINISTRY OF DEFENCE(DGQA)
KANPUR



ALL DIMENSIONS ARE IN mm

PLATE. ATTACHED TO SPECN.
NO. IND/GS/1913

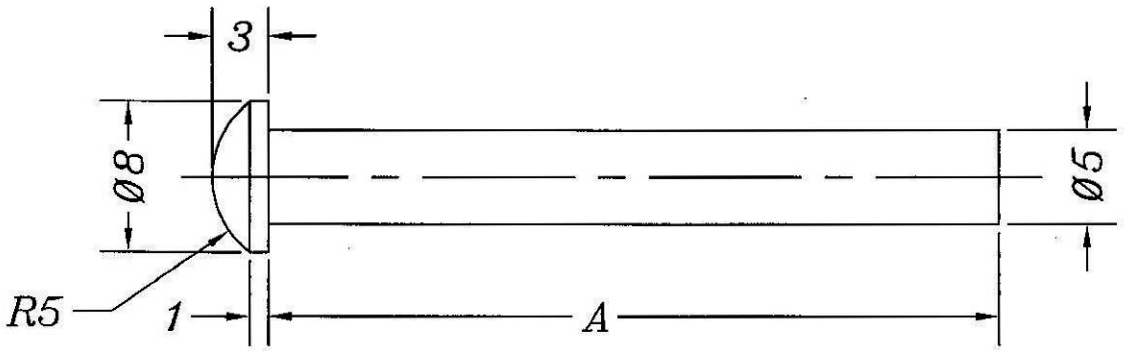
GS-9/81/2021

4 | 3 | 2 | 1

D | C | B | A

(4)

PIN



'A'	QTY.
40	1
37	1

NOTE:-

1.- ITEM TO BE CADMIUM PLATED AS PER IS:1572 - 1968
DEPTH OF COATING AS PER TABLE

DESIGNATION	SIZE
STEEL CONFORMING TO GRD C-55/MDN-172	A

(P.D.ARYA)
JTO (D)

	DATE	NAME
DGN.		
DRN.		P D ARYA
CHD.		P D ARYA
TRD.		
COMP.		

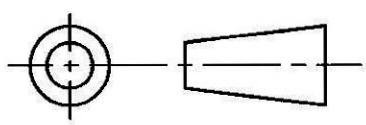
CQA (GS)
MINISTRY OF DEFENCE(DGQA)
KANPUR

PASSED BY:-
GO/GS-2

SCALE : - - -

APPROVED BY:-
DC/GS-2

HAMMER PITON



ALL DIMENSIONS ARE IN mm

PLATE ATTACHED TO SPECN. NO. IND/GS/1913

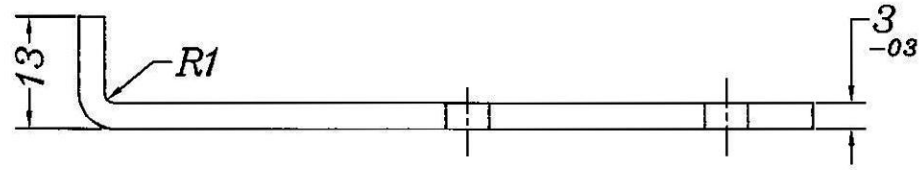
GS-9/81/2021

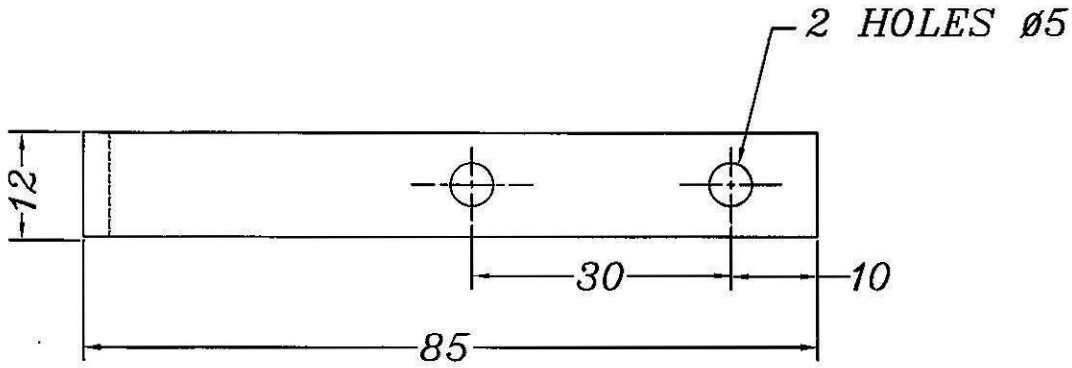
4	3	2	1

D C B A

(2)

LOCKING STRIP



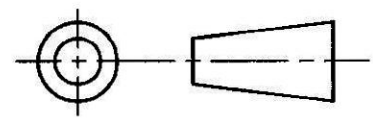


DESIGNATION	SIZE
STEEL CONFORMING TO GRD C-55/MDN-172 (AS PER DEF-STAN 10-13/2)	12 X 95

		DATE	NAME
(P.D.ARYA) JTO (D)	DGN.		
	RDRN.		P D ARYA
	CHD.		P D ARYA
PASSED BY:- GO/GS-2	TRD.		
	COMP		
APPROVED BY:- DC/GS-2	SCALE : - - -		

CQA (GS)
MINISTRY OF DEFENCE(DGQA)
KANPUR

HAMMER PITON



ALL DIMENSIONS ARE IN mm

PLATE. ATTACHED TO SPECN. NO. IND/GS/1913

GS-9/81/2021