UNSEALED SPECN NO. CQA(GS)/US/475 [03] [b]

(Supersedes Specn No. RDEE/ENGR/SPCN/0193/2)

FD

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GO/G-3

DEFENCE R&D ORGANISATION

R&DE (ENGINEERS)

R&DE (Engrs.) Dighi, Pune-15

Govt. of India Min. of Defence

GOVERNMENT OF INDIA
MINISTRY OF DEFENCE
RESEARCH & DEVELOPMENT ESTABLISHMENT (ENGRS)
DIGHI, PUNE-411015

UNSEALED SPECN NO. CQA(GS)/US/475 [03] [b]

SPECIFICATION No. RDEE/ENGR/SPCN/0193/2

FOR

[DSCAT NO. 5315-049698]

ICE PITON 'G'

ISSUED BY
THE CONTROLLER
CONTROLLERATE OF QUALITY ASSURANCE (GENERAL STORES)
POST BOX NO. 122
KANPUR

THIS SPECIFICATION OR ANY PATTERN DRAWING OR OTHER INFORMATION ISSUED IN CONNECTION THEREWITH, MAY ONLY BE USED FOR A SPECIFIC ORDER PLACED BY A COMPETENT OFFICER OF THE MINISTRY OF DEFENCE AND IS NOT TO BE USED FOR ANY OTHER PURPOSE WHATSOEVER

OK

CONTENTS

CERTIFICATE

Null
GO/G-9

Certified that this SPECIFICATION contains pages which have been serially numbered from ONE to SIXTEEN and initialed by me

Signature
Name : AK BANDYOPADHYAY
Designation : Scientist 'D'
Group : FD - MOUNTAINEERING EQUIPMENT

DDE (Engrs,) Dighi, Pune-15
Govt. of India, Min. of Defence

AMENDMENT RECORD SHEET

~~PROVISIONAL SPECIFICATION No. RDEE/ENGR/SPCN/0193/2~~

[DS CAT NO. 5315-049698]

SPECIFICATION FOR ICE PITON 'G'

Sr. No.	Date of amendment	Ref of Para / Clause	Amendments Carried out	Ref. to atuhorisation	Signatures of the person authorising it

UNSCALED SPECN NO. CEA(GS)/US/475 [03] [6]

GO/G-9

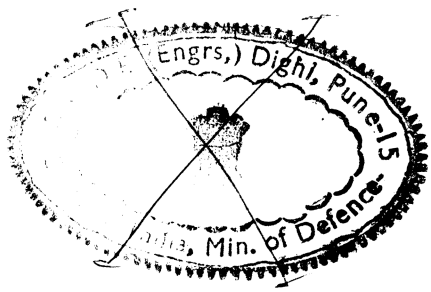
4.5-1, FM008 (Part -

[IDS CAT No. 5315-049698]

SPECIFICATION FOR ICE PITON 'G'

REVIEW AND APPROVAL

1. Recommendation of the Originator of the document



Approved / Not Approved

Signature

Brig (Dr.) R C PATHAK

Jt. Director

(Authorised Person)

2. Amendment to be effective from date :

SECTION I - GENERAL

1.1 This specification and other information issued in connection therewith may be used for a particular order placed or to be placed by a competent authority. It is not to be used for any other purpose, whatsoever, without **EXPRESS WRITTEN SANCTION OF THE ~~DIRECTOR, R&DE (Engrs), Dighi, PUNE-411015~~** Controller, Controllerate of Quality Assurance (General Stores), Kanpur on behalf of the Director General, Dte Gen of Quality Assurance, Min of Defence, New Delhi

1.2 This specification must be returned on submission of the tender/on completion of the order.

1.3 Any proposal for any change in this specification and the manufacture will be addressed to the ~~Director, Research & Development Establishment (Engineers), Dighi, PUNE-411015~~ Controller, Controllerate of Quality Assurance (General Stores), Kanpur. No request for any deviation will be entertained from the subcontractor, if any, except through the main Contractor.

1.4 The ~~inspecting~~ Inspection authority, at his discretion may check the test results obtained at manufacturer's work by independent test at the Govt. Test House or elsewhere.

SECTION II - SCOPE

2.1 This specification covers the materials, fabrication, manufacture, heat treatment, workmanship, quality control, inspection, testing and packing for Ice Piton 'G' type.

SECTION III - DRAWINGS & SPECIFICATIONS

3.1 Drawing numbers given below pertaining to Ice Piton 'G' form a part of this specification. Any modifications suggested during the manufacture of pilot samples shall be incorporated in these drawings with prior approval of ~~Inspecting~~ Inspection Authority.

DRAWING NO		NOMENCLATURE
EGA - 236/A	:	Ice Piton 'G'
EPD - 9056/A	:	Tube
EPD - 9057	:	Hook.

3.2 Tolerances. Tolerance on dimensions of the components shall conform to medium class as per IS-2102.

3.3 All materials used in the manufacture of Ice Piton 'G' type shall conform to the relevant Indian Standard specifications. Wherever these have not been specified relevant Defence or other specifications as mentioned shall be applicable.

3.4 The following specifications shall apply

Indian Standards		**Nomenclature**
IS-1572	:	Specification for electroplated coating of cadmium on iron or steel.
IS-1068	:	General tolerances for dimensions and form and position
IS-1757	:	Method for beam impact test (V notch) on steel.

DEFENCE STANDARD

DEF-STAN-10/13/2	:	Special steel produced by Mishra Dhatu Nigam Ltd., Hyderabad.

PROPRIETARY

MDN-172	:	Special steel produced by Mishra Dhatu Nigam Ltd., Hydrabad.

3.5 Copies of Indian Standard specifications referred to above may be obtained from Bureau of Indian Standards, Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI-110001.

SECTION IV - GENERAL DESCRIPTION

4.1 Ice Piton 'G' governed by this specification is required for glacier and high altitude areas. This is used as climbing aid in glacier and high altitude areas covered with snow/ice.

4.2 It is a metal spike with an eye in one end, that can be driven into a crack in ice. It has got a spiral along its length and a cutting edge at the other end.

SECTION V - MATERIALS

5.1 Ice Piton 'G' shall be made of special cold resistant steel C-55 as per DEF-STAN-10/13/2 or MDN-172 manufactured by Mishra Dhatu Nigam Ltd., Hyderabad.

SECTION VI - MANUFACTURE, WORKMANSHIP AND FINISH

6.1 The Ice Piton 'G' shall be manufactured by adopting the procedures narrated below.

~~6.1.1 This Piton shall be manufactured from round bar 20 mm dia and 175 mm length of steel C-55 as per DEF-STAN-10-13/2 or MDN-172 by machining adopting the following processes:~~

~~a) Machining~~

~~b) Heat treatment~~

~~c) Shot blasting~~

~~d) Welding~~

~~e) Cadmium coating.~~

6.1.1 THIS PITON SHALL BE MANUFACTURED BY THE (a)
~~6.1.2 If the raw material used is more than 20 mm dia the~~ methods to be followed ~~is~~ as under :-

a) Blanking

b) Forging

c) Machining

d) Heat treatment

e) Shot Blasting

f) Welding

g) Cadmium coating.

6.1.2 ~~6.1.3~~ Heat Treatment. Ice Piton 'G' shall be made of special steel C-55 as per DEF-STAN-10-13/2 or MDN-172 and shall be subjected to heat treatment after forging/ manufacture.

6.1.3 ~~6.1.4~~ Tempering. Tempering cycle shall start as early as possible after the temperature of forged components comes to 80 deg. C. However, in no case, the components shall be allowed to dwell in room temperature for more than 4 hours. The components

shall be charged into furnace with 350 deg. C to 400 deg. C temperature which shall be maintained for 4 hours. After soaking the components at that temperature for two hours the temperature of the furnace shall be raised to 650 deg. C. uniformly in four hours. The rate of increase of temperature shall be approximately 60 deg. C to 70 deg C per hour. The soaking period of 650 deg. C shall be four hours minimum. After this the components shall be removed from the furnace and allowed to cool in the air at ambient atmosphere.

6.2 Forging Temperature. The maximum 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.

6.3 Hardening. After forging, the components shall be cooled to room temperature by sand cooling. The same 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. plus or minus 10 deg. C. as far as possible in two hours and 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.

6.4 The hardness of the components after heat treatment shall be within the range of 350 to 450 HV.

6.5 Workmanship and Finish. The workmanship and finish of each of the equipment shall be of the highest order and at par with those of similar equipment available in the developed countries.

SECTION VII - QUALITY CONTROL

7.1 Quality control shall be exercised by adopting the procedures enumberated below :

(a) **Impact Test.** Sample test pieces from each lot of special steel C-55 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.

(b) **Hardness Test.** The samples shall be tested for their hardness which shall be within the range of 350 to 450 HV.

(c) **Crack Detection Test.** All components shall be subjected to crack detection test before plating by adopting any of the non-destructive test methods.

7.2 Sampling & Conformity Criteria. The sampling for various tests described for quality control

shall be at the discretion of the Inspecting Authority.

7.3 Pre-Inspection. Manufacturer/Contractor must satisfy themselves that the stores are in accordance with the terms of contract and fully conform to the required specification by carrying out a thorough pre-inspection of all materials before actually tendering the same for inspection to the inspecting authority at the pilot sample stage. A declaration by the Contractor that the necessary pre-inspection has been carried out on the stores tendered shall be submitted along with the request for inspection and clearance of materials for the pilot sample. The declaration will also indicate the method followed in carrying out the pre-inspection will be accompanied by manufacturer's test certificate and laboratory test results, wherever relevant.

SECTION VIII - INSPECTION

8.1 It shall be open to Government representative to inspect the components of Ice Piton 'G' as per the Compliance Matrix enclosed as Appendix 'A' with this specification at any stage of manufacture namely :

a) Pre-inspection stage
b) Production stage
c) Stage of preparation for delivery.

The manufacturer shall provide all facilities, free of charge, for carrying out inspection.

8.2 No part of the work shall be repaired or rectified without the approval of the Inspecting Authority.

8.3 The Contractor shall afford, at his own expense, the Inspecting Officer of reasonable accommodation and inspection and testing facilities for satisfying himself that the stores are being or have been manufactured in accordance with the specification and for this purpose the Inspector shall have full and free access at any time during the contract to the Contractor's work and may require the Contractor to make arrangement for anything pertaining to this contract, to be inspected at his premises or any other connected place and the Contractor shall arrange similar facilities at his own expense as regards any sub-contract he may make.

8.4 The Contractor shall pay all the costs connected with such tests and any other tests covered under quality control provision and provide without any extra charges, all materials, tools gauges, labour and assistance, other than special or independent tests which he shall require to be made on Contractor's premises and shall pay all costs attendant thereon,

failing these facilities (in regard to which the Inspector shall be sole judge) at his own premises for making the tests, the Contractor shall bear the cost of carrying out such tests elsewhere.

GO/GG

SECTION IX - PACKING & IDENTIFICATION

9.1 **Identification.** The Ice Piton 'G' shall be legibly stamped/marked at a suitable place with the manufacturer's recognised trade mark on the piton.

9.2 **Packing.** The finished Ice Piton 'G' with the identification mark shall be securely packed after applying coating of accepted preservative to be decided in consultation with the Inspecting Authority, separately in polythene bags made out of polythene film of suitable gauge. Fifty Nos of Ice Piton 'G' shall be packed in cardboard boxes as the mode of packing for bulk quantities. The size of the cardboard boxes shall be decided depending on the total volume of the Piton to be placed in each case.

9.3 **Identification of Packages.** Each cardboard box shall have the reference of the contact particulars, date of manufacture, lot number (lot number shall be given at the time of subjected the components to heat treatment) and total weight, painted / stamped legibly on it. Also each wooden case shall have the details giving the following information.

a) Manufacturer's Name

b) Description of Material

c) Weight of consignment.

d) Any other particulars required by the Inspecting Officer.

COMPLIANCE MATRIX WITH REFERENCE TO THE INSPECTION OF ICE PITON 'G' AS PER SPECIFICATION NO. RDE/ENGR/SPCN/0193/2

Section/ Paragraph	DESCRIPTION	COMPLIES	REMARKS YES / NO/ SATISFACTORY
	QUALITY CONFORMANCE INSPECTION PARAMETERS		
VIII/8.1	**a) INSPECTION OF BASIC MATERIALS**		
	1) Samples of all basic materials as Per the relevant standards		
	2) Basic materials accepted based on test certificate from recognised laboratories submitted by the Contractor		
	3) Basic materials supplied by the Govt.		
	4) Basic material procured by the Contractor.		
	b) INSPECTION OF TOOLINGS & FACILITIES		
	1) Pitons manufactured by using the toolings made by the Contractor.		
	2) Pitons made by machining - jigs and fixtures for machining.		
	3) Test facilities as per Section VII		

c) EQUIPMENT ON THE SHOP FLOOR

Hull 6
G6/G9

Visual Inspection

1) General appearance & finish.

2) Free from cracks & burrs.

3) Finish of weld joint of the eye.

4) Sharpness of the spiral and cutting edge (flute).

5) Rounding of corners.

Dimensional Inspection

1) Overall dimensions.

2) Critical dimensions.

3) Weight (between gms to gms)

d) HEAT TREATMENT

1) Test pieces (3 Nos) for impact testing as per IS-1757.

2) Heat treatment cycle for pitons and test pieces.

3) Hardness of the pitons and that of the test pieces.

e) ENVIRONMENTAL TESTS

Charpy 'V' Notch testing value at minus 40 deg. C

f) FUNCTIONAL TESTS

1) Pitons (5 Nos) kept in the environmental chamber at minus 40 deg. C when taken out and subjected to hammering by HAMMER PITON shall not break and develop cracks.

2) Detection of cracks in pitons in each lot.

g) FINISHING

1) Quality of cleaning after heat treatment.

2) Quality of cadmium coating.

h) PACKING

1) Polythene bag/thermocole box.

2) Sealing of box.

3) Bulk quantity packing.

j) IDENTIFICATION

1) Markings.

CONCLUSION

The Ice Piton 'G' comply in all aspects to the extent furnished herein.

Specimens of material have been tested as per relevant standards mentioned in the specification.

Certified to be acceptable.

(AK BANDOPADHYAY)
JAG (NFSG)
CONTROLLER
CONTROLLERATE OF QUALITY ASSURANCE
GENERAL STORES
POST BOX NO. 197
KANPUR 208001

AUTHORISED REP FOR INSPECTING AUTHORITY

09/12/04
GO/G-9
(N ULLAH)
SSOI

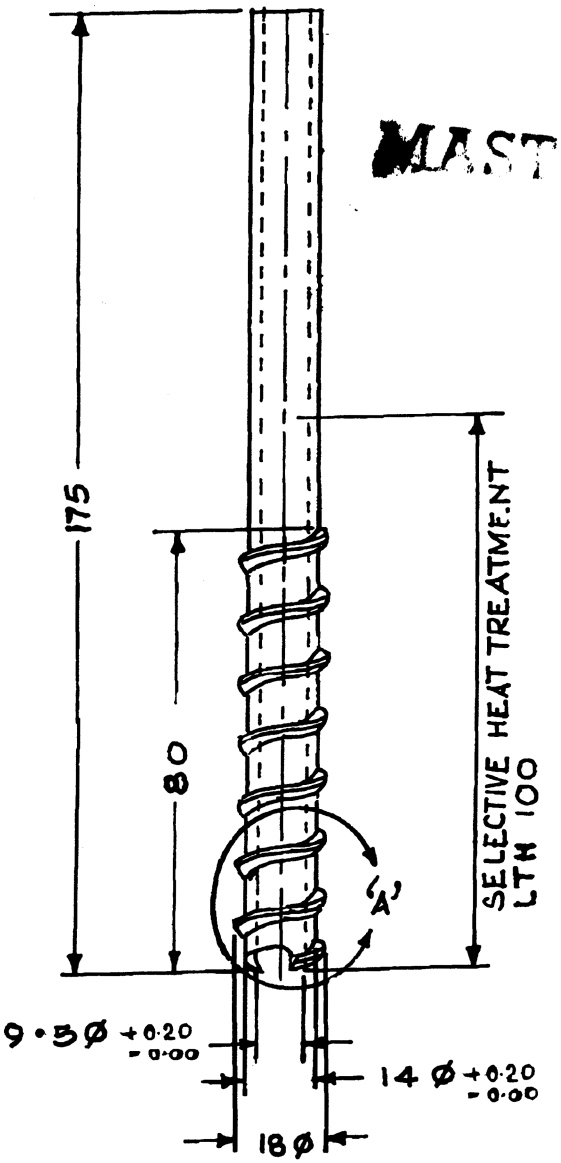
DC
(JASBIR SINGH)
Lt. Col.

PROJECT OFFICER FOR DIRECTOR

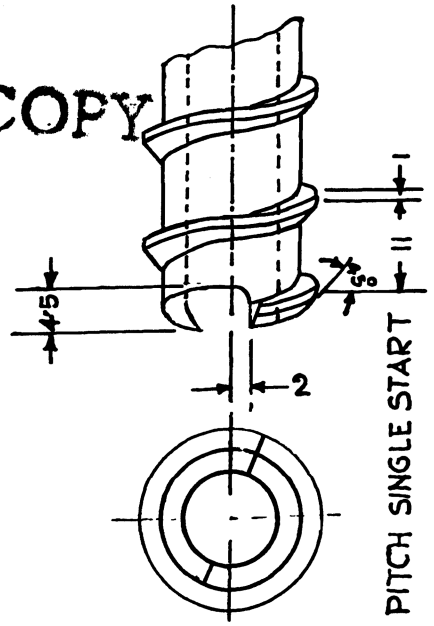
JC
(DR YADAV)
JAG(NFSG)

AR 10

TUBE



ENLARGED VIEW AT 'A'



THREADS DETAILS

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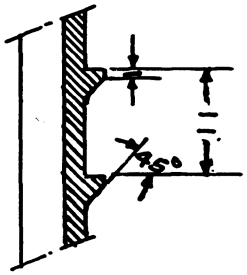
JTO GO/GS-9



Ⓐ NOTE:-
1 HEAT TREATMENT AS PER SPECIFICATIONS

(P DARYA) CHIEF D/MAN		DATE	NAME	DSCAT No. 5315-049698
PASSED BY GO (GS-4)	DGN			
	DRN			
	CHD			
	TCD			
	COMP			
APPROVED BY DC (GS-4)	SCALE :- NTS			

ICE PITON 'G' TYPE

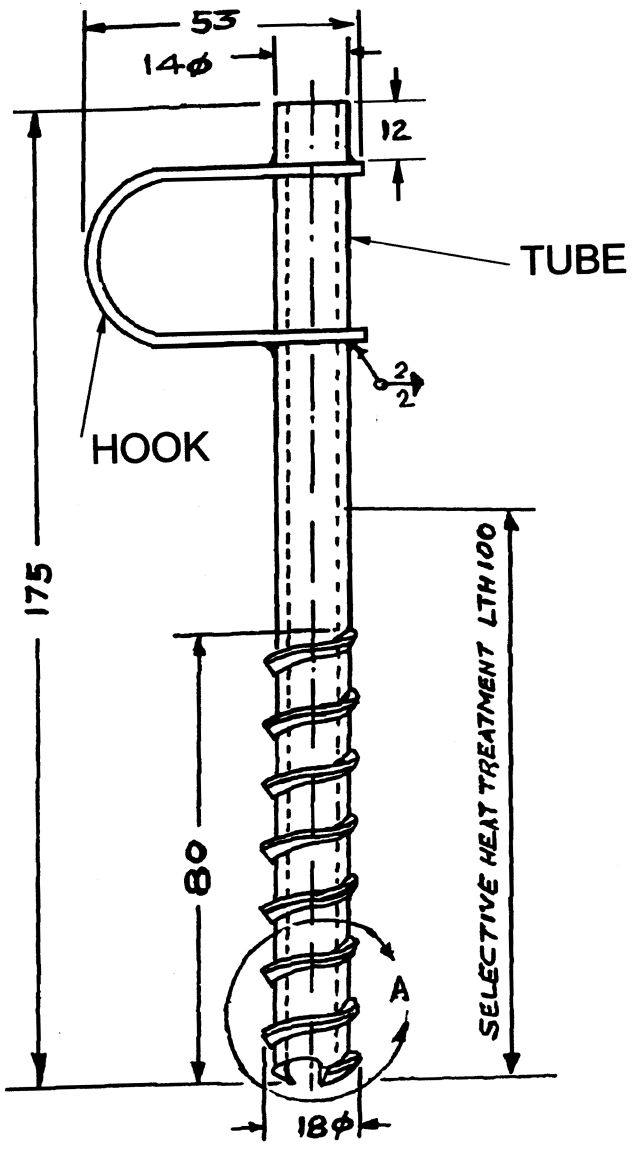
CQA (GS) KANPUR

DIMENSIONS IN mm

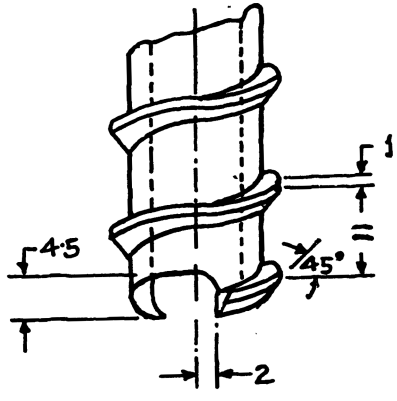
DRG. ATTD. UNSEALED SPECN. No. CQA(GS)/US/475(a)

GS-9 / 77 / 2008 [b]

ASSEMBLY



ENLARGED VIEW AT 'A'



S J Kolarkar
JTO GO/G-9

(A.) NOTE-

1. HEAT TREATMENT AS PER SPECIFICATIONS.
2. ITEM TO BE CADIMUM PLATED AS PER IS-1572-1960. DEPTH OF COATING AS PER TABLE 1

		DATE	NAME		
(P D ARYA) CHIEF D/MAN	DGN			DSCAT No. 5315-049698	C.Q.A.(GS) KANPUR
	DRN				
PASSED BY GO (GS-4)	CHD			ICE PITON 'G' TYPE	
	TRD				
	COMP				DIMENSIONS ARE IN mm
APPROVED BY DC. (GS-4)	SCALE- N.T.S.				DRG. ATTD TO UNSEALED SPEC'N. No. CQA(GS)/US/475 (a)

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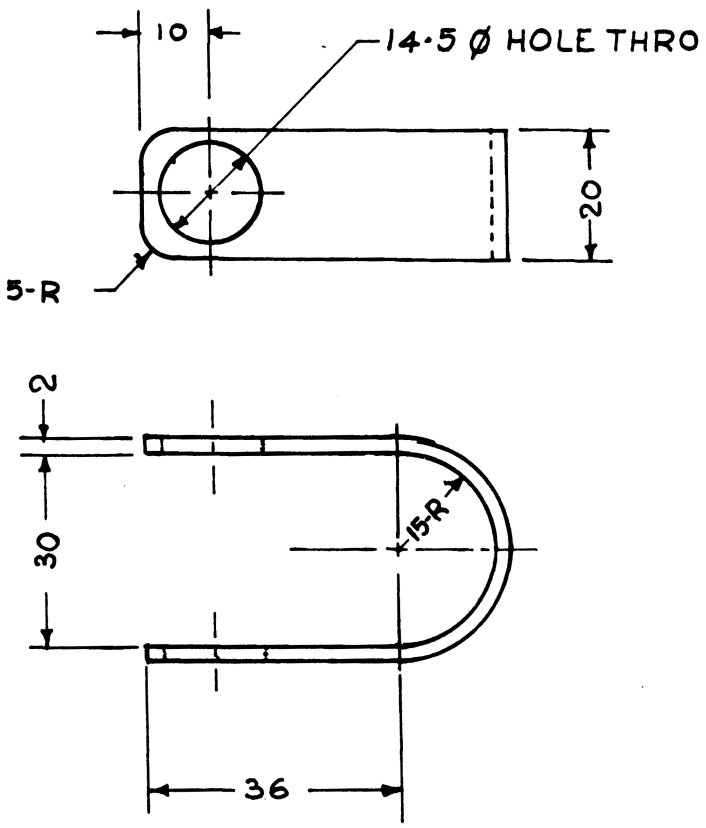
JTO GO/G-9.

HOOK



(P D ARYA) CHIEF D/MAN		DATE	NAME	DSCAT No. 5315-049698	C Q A (G S) KANPUR
PASSED BY GO (GS-4)	DGN				
	DRN			ICE PITON 'G' TYPE	DIMENSIONS IN mm
	CHD				
APPROVED BY DC (GS-4)	TCD				DRG ATTD TO UNSEALED SPECN No CQA(GS)/US/475 (2)
	COMP			SCALE:- NTS	

GS-9/77/2008 [6]