IPSS	**SPECIFICATION FOR SINGLE, DOUBLE & TRIPLE SHEAVE PULLEY BLOCKS FOR FIBRE ROPE (***Second Revision* **)**	**IPSS:1-07-005-14**
	Corresponding IS does not exist	Formerly: IPSS:1-07-005-00 **(***First Revision* **)**

0. FOREWORD

0.1 This Inter Plant standard has been prepared by the Subcommittee on Portable Maintenance Equipment, IPSS 1:7, with the active participation of the representatives of all the steel organizations, consultants and established manufacturers of pulley blocks and was adopted in August 2000 and now revised in July, 2014 keeping in view of latest developments.

0.2 Inter Plant Standardization for steel industry primarily aims at achieving rationalization and unification of parts and sub-assemblies used in steel plant equipment and accessories, and provides guidance in indenting stores for existing equipment (or while placing orders for additional requirements) by individual steel plants. For exercising effective control on the inventories, it is advisable to select a fewer number of sizes (or types) of products mentioned in this document, in the form of Company Standard of individual steel plants; it is not desirable to make deviation in technical requirements.

0.3 This standard has been made in combining the three standards, formerly of IPSS:1-07-005, IPSS:1-07-006 & IPSS:1-07-012, for convenience of user departments in the steel plants, to curtail down the search time of the users and bring them ease of references.

1. SCOPE

1.1 This standard covers the requirements of single, double and triple sheave pulley blocks for fibre ropes of the following sizes :

Type	**Sheave size**	**Nominal size of the fibre rope**	**Maximum Safe Working load (SWL) in kg**
Single sheave pulley blocks	65-150 mm	10-26 mm	250
Double sheave pulley blocks	65-205 mm	10-40 mm	500
Triple sheave pulley blocks	65-205 mm	10-40 mm	3600

2. TERMINOLOGY

2.1 For the purpose of this standard the definition given in IS:6498-1971(reaffirmed in 1991) “Glossary of terms used in connection with pulley blocks” shall apply.

3. DESIGNATION

3.1 The designation of single, double and triple sheave pulley blocks shall indicate the sheave diameter and rope diameter with prefix `S' for single, `D' for double and `T' for triple sheave pulley block. The designation for triple sheave pulley block with sheave size 65 and rope dia 10 shall be T65x10. Similarly for single and double it shall be S65x10 and D65x10 respectively.

4. LOAD CAPACITY

4.1 The maximum safe working load (SWL) and proof load (PL) shall be given in Table-1 (given below). The factor of safety shall not be less than 5.

TABLE-1

LOAD CAPACITY OF SINGLE (S), DOUBLE(D) AND TRIPLE (T) SHEAVE PULLEY BLOCK IN Kg

Designation	Sheave dia	Rope dia	Safe working load (in Kg)			Proof load (in Kg)		
			S	D	T	S	D	T
S/D/T	65	10	37	100	150	150	200	300
S/D/T	90	14	100	250	400	400	500	800
S/D/T	120	20	275	600	900	1100	1200	1800
S/D/T	150	26	500	1400	2100	2000	2800	4200
D/T	205	40		2500	3600		5000	7200

NOTE: Factor of safety for the purpose of this standard shall be the ratio of the ultimate strength of the block and the resultant load imposed on the block by the suspension of a safe working load under the most severe condition of rigue. This ratio shall cover any additional stress caused by the fictional resistance and acceleration under normal service conditions.

5. MATERIAL

5.1 The material of the pulley blocks shall be as given in Annexure-1 (page –21).

6. CONSTRUCTION AND DIMENSION

6.1 Hook - The hook shall be forged in one piece and shall be special trapazoidal section point hook with shank as given in Table-3 of IS 15560 (reaffirmed in 1991) "Specification for point hooks with shank for 160T". Ultrasonic testing for hook shall be done. For ease of reference, relevant details for hook for pulley blocks from IS 3815 as applicable

6.2 in steel industry are given in Table-2 (page 5).

6.2.1 The shank of the head fittings shall have thread as specified in IS 4218 (part-3)-1999 “ISO metric screw thread; part-3 Basic dimensions for design profile (first revision)” and shall be hot clinched after fixing the cross head and the round neck. The dimensions of the round neck shall be as given in Table-2 (page-5).

6.3 Cross head – The cross head shall be neatly and cleanly dressed. Holes for the shank of the hook and through pin shall be incorrect alignment and at right angle to each other. The dimensions of the cross head shall be as given in Table-3A and 3B (page 6 & 7 respectively).

6.4 Sheave – The sheave dimensions shall be as given in Table-4 (page 8).

6.5 Bottom through pin and bottom distance piece – The dimensions shall be as given in Table-5A & 5B (1) page 9 & 10 respectively. The end of the bottom through pin shall be pinned over the nut.

6.6 Top through pin and top distance washer – The dimensions shall be as given in Table-5B (2) page 11. The end of the through pin shall be pinned over the nut.

6.7 Axle pin and split pin – The dimensions shall be as given in Table-6 (page 12). Axle pin shall be machined from a bar not less than 3 mm larger in dia meter than the dia meter of the head portion of the axle pin.

6.8 Beckets – The beckets shall be forged in one piece and shall conform to the dimensions given in Table-7 (page –13).

6.9 Side plate – The side plate shall conform to the dimensions given in Table-8A & 8B (page 14 & 15 respectively). It shall be free from sharp edges, burrs and fins.

6.10 Side strap – The side strap shall conform to the dimensions given in Table-9A & 9B (page 16 & 17) respectively. It shall be free from sharp edges, burrs and fins.

7. LOAD TEST

7.1 After proof testing, all parts of the block shall be thoroughly examined. The shank of the hook and the sheave shall be rotated freely by hand, and block shall be free from deformation, cracks, flaws and any other defects.

7.2 The becket shall be tested 1/3 of the proof load applied to the block and there shall not be any visible permanent distortion at this load.

8. MARKING

8.1 The following information shall be legibly and permanently marked on the block :

a) Name of the manufacture or his Trade Mark
b) Designation of the block
c) Number of this standard i.e. IPSS:1-07-005.
d) Maximum safe working load in kg in the location as shown in page-1.
e) Identification number of the block

9. TEST CERTIFICATE

9.1 The manufacturer/supplier shall supply a Test Certificate for compliance of each pulley block with the provisions of this standard.

The proforma for the Test Certificate shall be as given in Appendix-A (page 22).

APPENDIX – A

PROFORMA FOR THE TEST CERTIFICATE

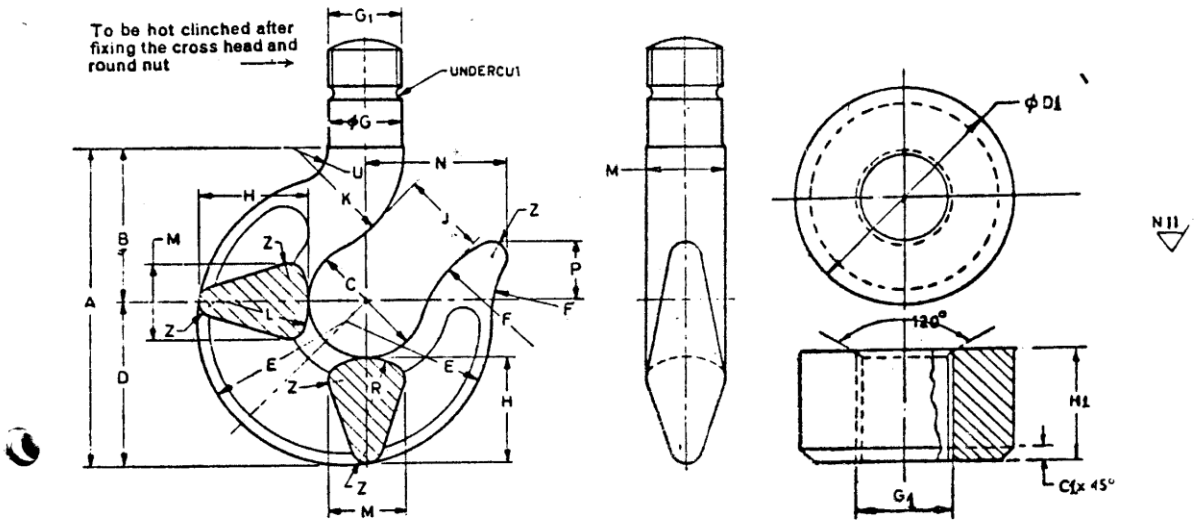
XXX & COMPANY LTD

Test Certificate Number _____

Dated _____

Item of stores; Single/Double/Tripple Sheave Pulley Blocks

Identifation no.	Designation	Maximum SWL (kg)	Proof load on block		Proof load on becket	
			Load applied Kg	Remarks after visual inspection	Load applied Kg	Remarks after visual inspection



Note: Undercut according to IS:1369-1993 "Dimensions of screw thread run outs and undercuts"

HOOK ROUND NUT

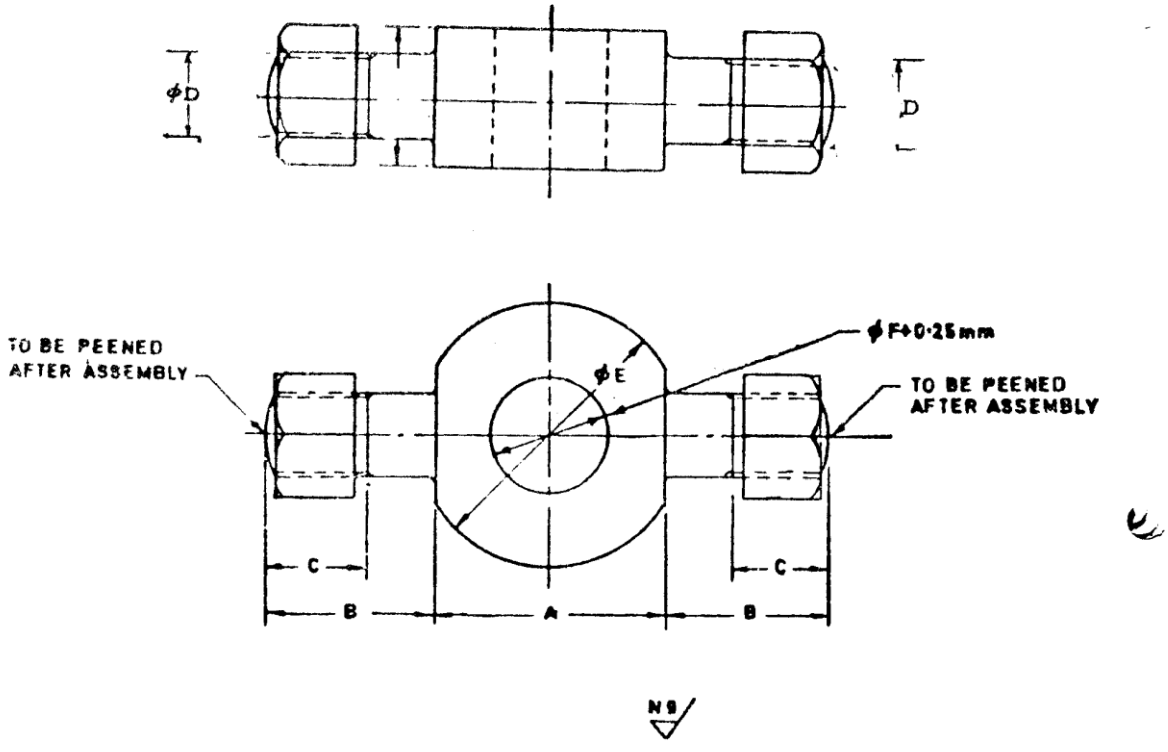
Note: Undercut according to IS:1369-1993 "Dimensions of screw thread run outs and undercuts"

HOOK AND ROUND NUT FOR SINGLE, DOUBLE AND TRIPPLE SHEAVE PULLEY BLOCK

TABLE – 2
(Read along with Figure above)

DIMENSIONS OF HOOK AND ROUND NUT FOR SINGLE, DOUBLE AND TRIPPLE SHEAVE PULLEY BLOCK (ALL DIMENSIONS ARE IN mm)

Pulley Designation		Dimensions of hook																	Dimensions of n			
		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	U	Z	D1	H1	C1	
S/D/T	65X10	69	33	28	36	32	28	12	22	22	23	16	16	29	12	11	7	3	19	10	2	
S/D/T	90X14	69	33	28	36	32	28	12	22	22	23	16	16	29	12	11	7	3	19	10	2	
S/D/T	120X20	98	47	40	51	45	40	20	31	30	32	23	21	41	17	16	10	4	27	15	2	
S/D	150X26	140	67	57	73	64	57	25	44	43	46	33	29	59	24	22	14	6	36	18	2	
T	150X26	177	84	72	93	80	72	30	55	54	58	41	36	74	30	28	18	7	45	22	2	
D	205X40	177	84	72	93	80	72	30	55	54	58	41	36	74	30	28	18	7	45	22	2	
T	205X40	221	105	90	115	102	90	40	70	66	72	52	46	93	38	35	22	9	56	25	2	

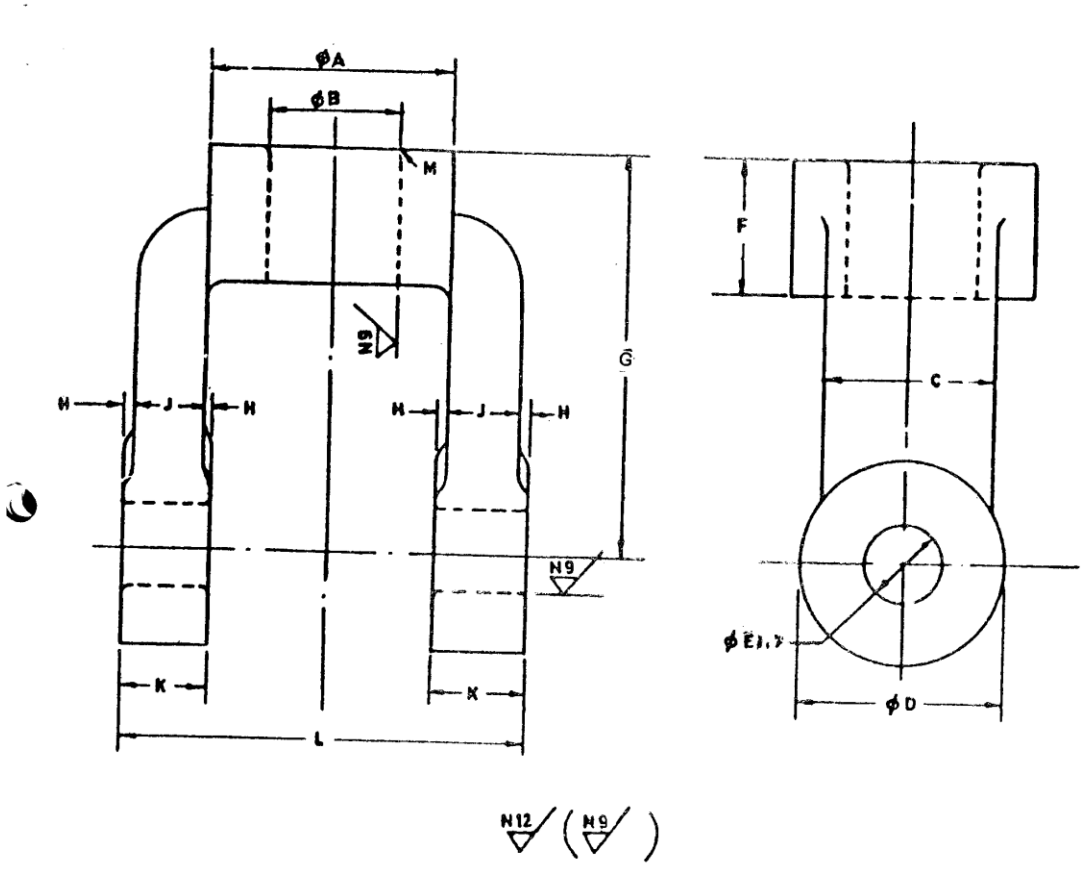


CROSS HEAD FOR FOR SINGLE SHEAVE PULLEY BLOCK

TABLE – 3A
(Read along with Figure above)

CROSS HEAD FOR FOR SINGLE SHEAVE PULLEY BLOCK
(ALL DIMENSIONS ARE IN mm)

Pulley Designation	A	B	C	D	E	F	G	Standard thread on the two ends
S65X10	20	11	10	8	24	12	16	M 8
S90X14	20	19	13	10	29	12	19	M 10
S120X20	31	21	14	12	38	20	22	M 12
S150X26	37	25	17	16	44	25	25	M 16

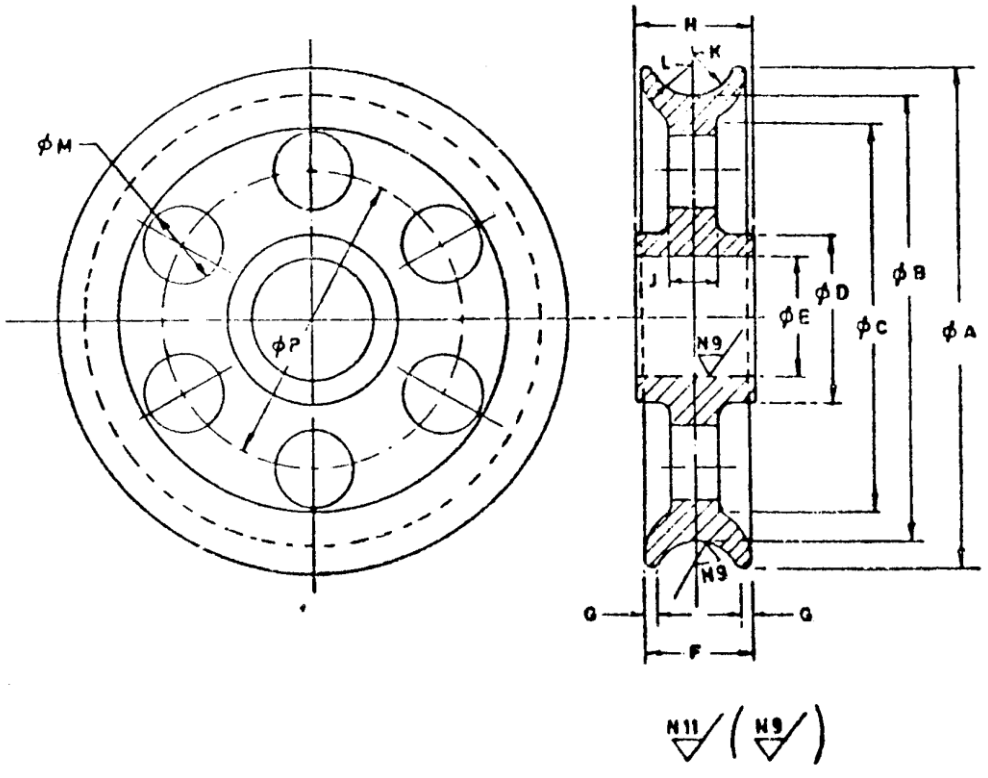


CROSS HEAD FOR FOR DOUBLE & TRIPPLE SHEAVE PULLEY BLOCK

TABLE – 3B
(Read along with Figure above)

CROSS HEAD FOR FOR DOUBLE & TRIPPLE SHEAVE PULLEY BLOCK
(ALL DIMENSIONS ARE IN mm)

Pulley Designation	A	B	C	D	E	F	G	H	J	K	L	M
D/T 65X10	29	12	13	19	8	16	44	1.0	5	7	41	2
D/T 90X14	29	12	16	22	10	19	52	1.5	6	9	44	2
D/T 120X19	44	20	19	30	12	22	70	3.0	7	13	65	2
D/T 150X26	51	25	25	33	16	25	79	3.0	9	15	75	3
D/T 205X40	59	30	38	51	22	35	100	4.5	21	30	111	3

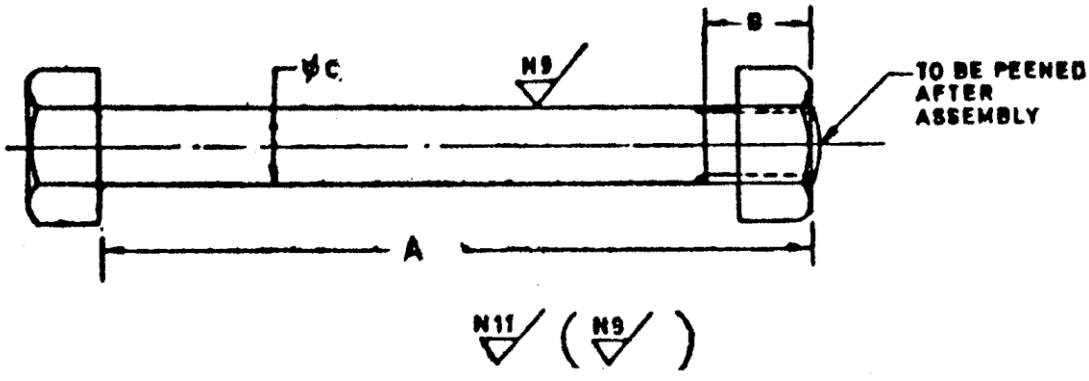


SHEAVE FOR FOR SINGLE, DOUBLE & TRIPPLE SHEAVE PULLEY BLOCK

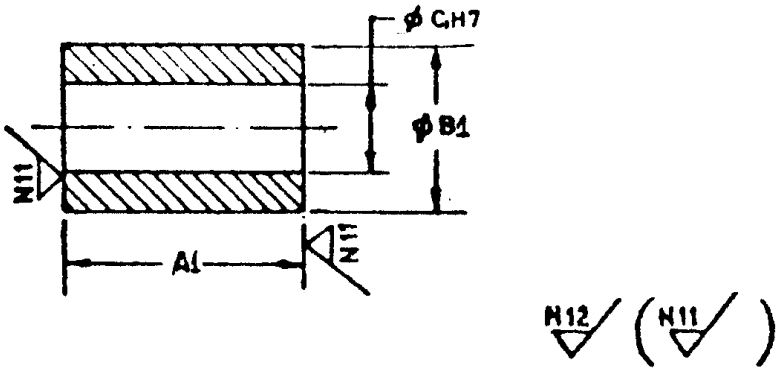
TABLE – 4
(Read along with Figure above)

SHEAVE FOR SINGLE, DOUBLE & TRIPPLE SHEAVE PULLEY BLOCK
(ALL DIMENSIONS ARE IN mm)

Pulley Designation	A	B	C	D	E	F	G	H	J	K	L	M	NO. OF HOLES	P
S/D/T 65X10	65	56	46	25	13	15	2	18	5	6	9	8	3	35
S/D/T 90X14	90	78	68	25	13	15	2	19	6	7	10	13	3	48
S/D/T 120X20	120	105	90	35	19	25	2	28	6	11	15	16	6	64
S/D/T 150X26	150	130	113	44	25	31	2	35	8	15	17	22	6	83
D/T 205X40	205	166	149	57	32	48	3	50	10	21	22	25	6	108



BOTTOM THROUGH PIN

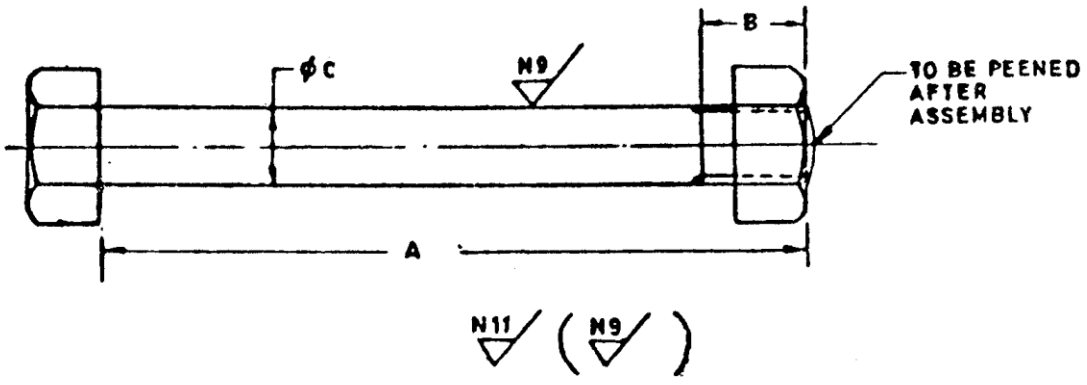


BOTTOM DISTANCE PIECE

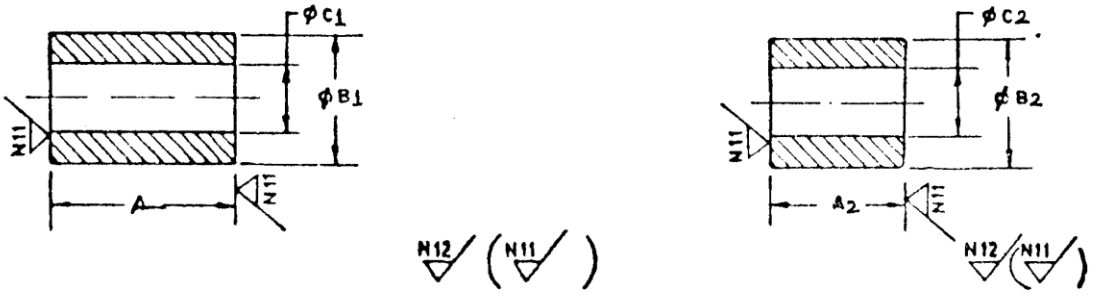
TABLE – 5A
(Read along with Figure above)

BOTTOM THROUGH PIN AND BOTTOM DISTANCE PIENCE FOR SINGLE SHEAVE PULLEY BLOCK
(ALL DIMENSIONS ARE IN mm)

Pulley Designation	A	B	C	A1	B1	C1
S65X10	35	10	6	-	-	-
S90X14	45	11	8	-	-	-
S120X20	60	15	10	23	22	10
S150X26	70	16	12	24	25	13



BOTTOM THROUGH PIN

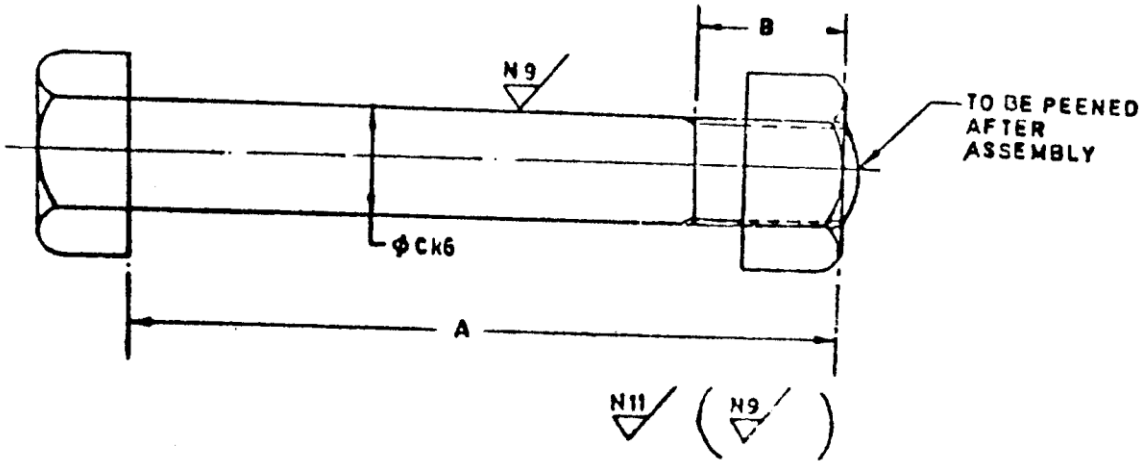


BOTTOM DISTANCE PIECE (BIG) **BOTTOM DISTANCE PIECE (SMALL)**

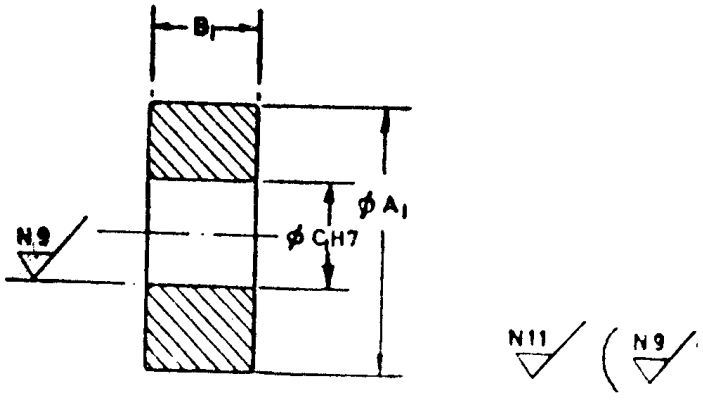
TABLE – 5B(1)
(Read along with Figure above)

BOTTOM THROUGH PIN AND BOTTOM DISTANCE PIENCE FOR DOUBLE & TRIPPLE SHEAVE PULLEY BLOCK
(ALL DIMENSIONS ARE IN mm)

Pulley Designation	Bottom through pin				Bottom distance piece (BIG)				Bottom distance piece (SMALL)		
	A		B	C	A_1		B_1	C_1	A_2	B_2	C_2
	D	T			D	T					
D/T65X10	54	85	8	6	19	20	16	6	-	-	-
D/T90X14	67	91	10	8	20.5	20	19	8	-	-	-
D/T120X20	89	125	11	10	30	30	22	10	23	22	10
D/T150X26	106	150	14	12	36	36	30	13	23	30	13
D/T205X40	146	205	14	12	55	55	33	13	40	35	13



TOP THROUGH PIN

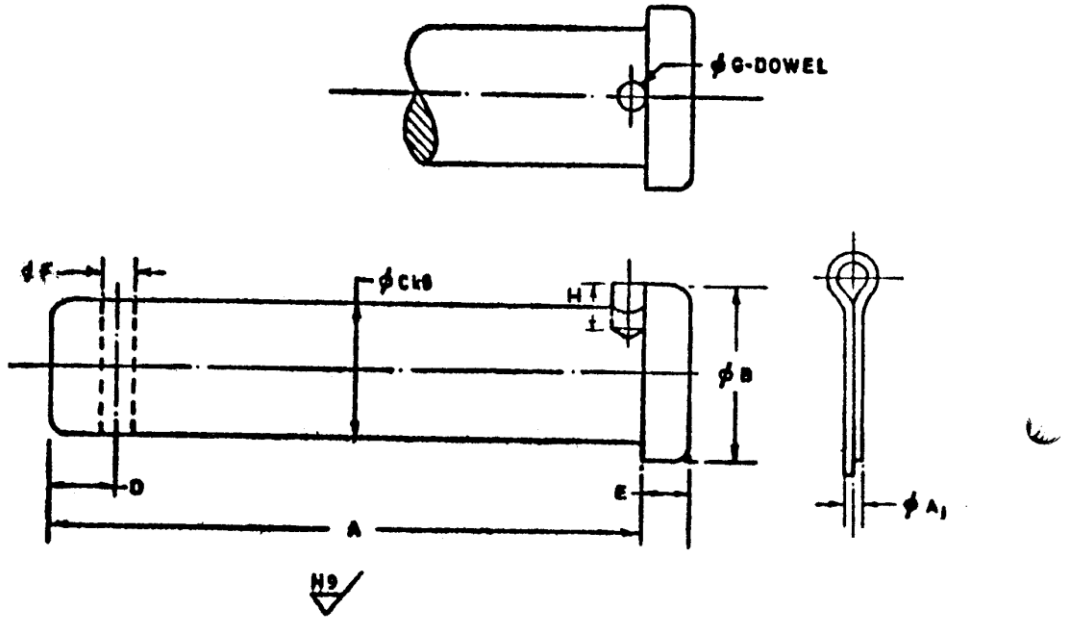


TOP DISTANCE WASHER

TABLE – 5B(2)
(Read along with Figure above)

TOP THROUGH PIN AND TOP DISTANCE WASHERS FOR DOUBLE & TRIPPLE SHEAVE PULLEY BLOCK
(ALL DIMENSIONS ARE IN mm)

Pulley Designation	A		B	C	A_1	B_1			C_1
	D	T				D	TS	Tb	
D/T65X10	58	85	11	8	19	12	15	22	8
D/T90X14	70	95	13	10	22	11	11	20	10
D/T120X20	92	130	14	12	30	17	19	32	12
D/T150X26	110	155	17	16	39	21	24	39	16
D/T205X40	158	215	25	22	51	24	30	55	22

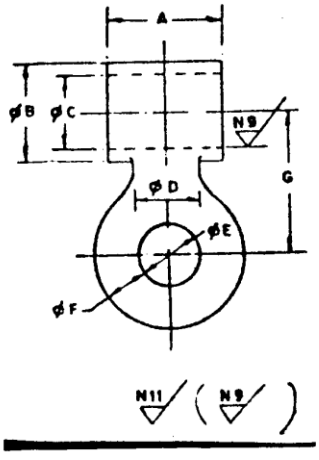


AXLE PIN AND SPLIT PIN FOR SINGLE, DOUBLE AND TRIPPLE SHEAVE PULLEY BLOCK

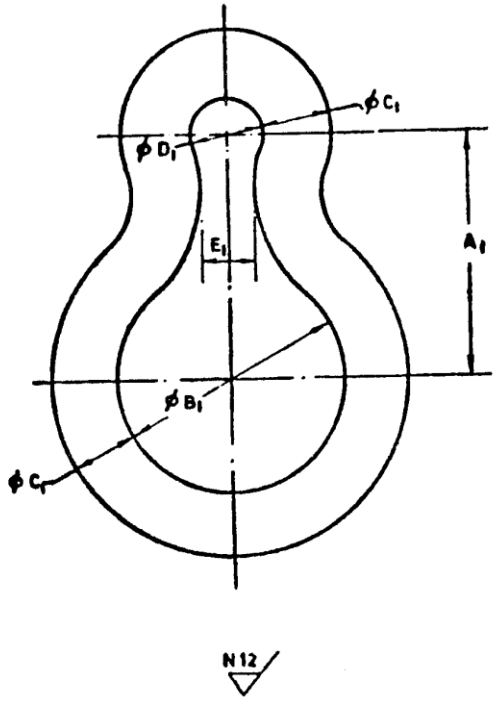
TABLE – 6
(Read along with Figure above)

AXLE PIN AND SPLIT PIN FOR SINGLE, DOUBLE AND TRIPPLE SHEAVE PULLEY BLOCK
(ALL DIMENSIONS ARE IN mm)

Pulley Designation	A			B	C	D	E	F	G	H	A_1
	S	D	T								
S/D/T65X10	30	56	85	16	13	5	5	4	3	6	3.2
S/D/T90X14	45	68	90	16	13	6	5	4	3	6	3.2
S/D/T120X20	56	92	128	22	19	8	5	6	4	8	5.0
S/D/T150X26	69	109	152	29	25	9	5	6	4	8	5.0
D/T205X40	-	149	210	35	32	13	6	7	5	10	6.3



BECKET TYPE A

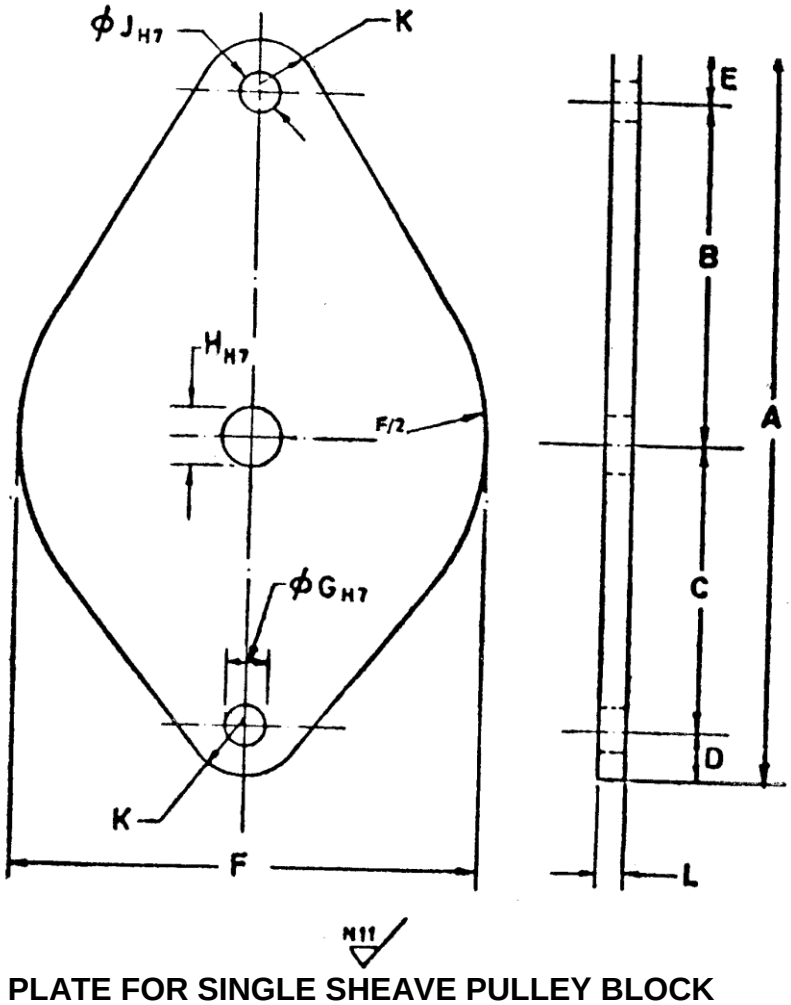


BECKET TYPE B

TABLE – 7
(Read along with Figure above)

BECKET FOR SINGLE, DOUBLE AND TRIPPLE SHEAVE PULLEY BLOCK
(ALL DIMENSIONS ARE IN mm)

Pulley Designation	**Type A**							Type B				
	A	B	C	D	E	F	G	A_1	B_1	C_1	D_1	E_1
S/D/T65X10	20	16	6	13	13	6	25	-	-	-	-	-
S/D/T90X14	20	19	8	14	16	6	35	-	-	-	-	-
S/D/T120X20	-	-	-	-	-	-	-	38	29	8	10	8
S/D/T150X26	-	-	-	-	-	-	-	41	41	13	13	11
D/T205X40	-	-	-	-	-	-	-	51	41	14	13	13

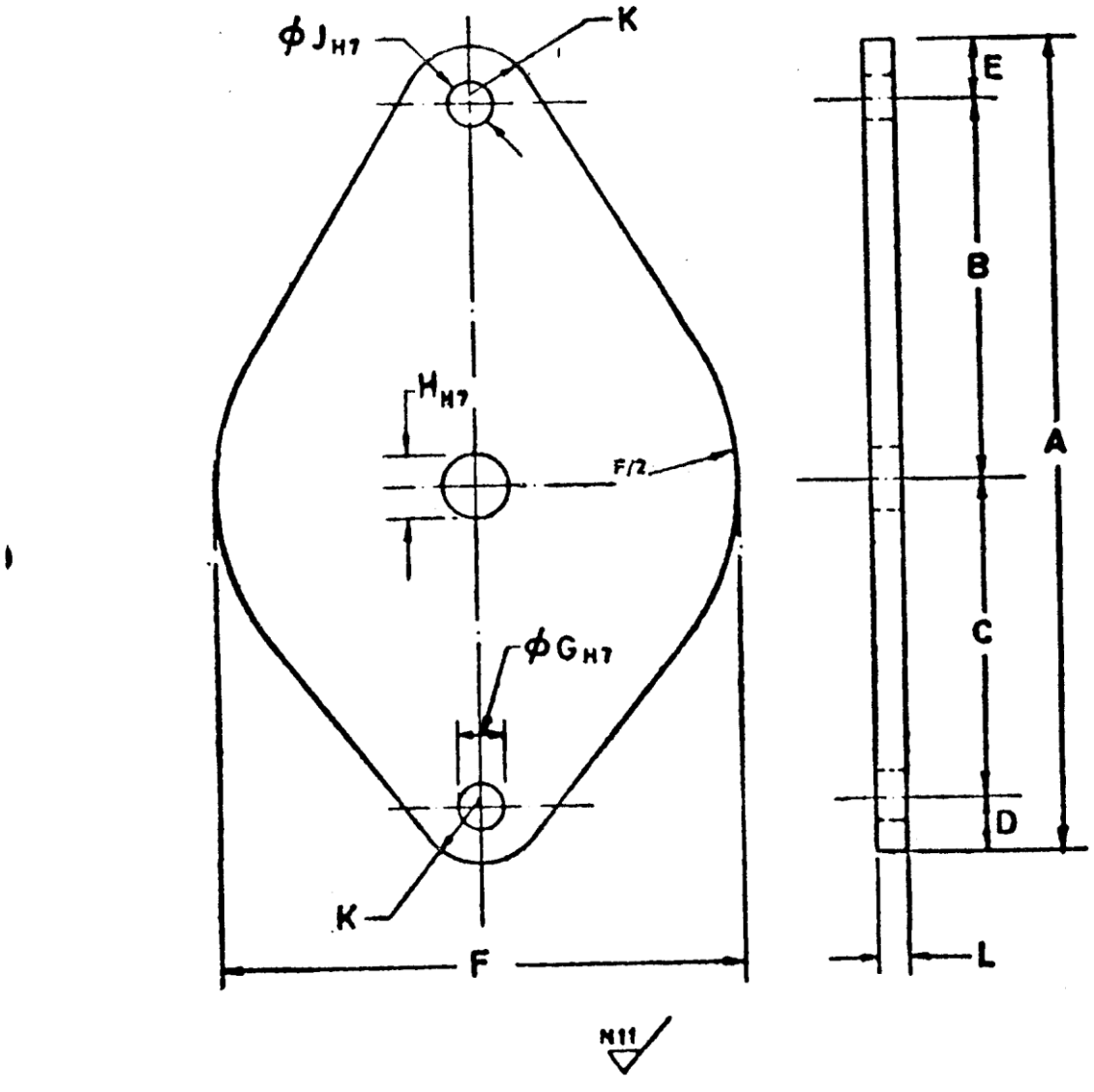


SIDE PLATE FOR SINGLE SHEAVE PULLEY BLOCK

TABLE – 8A
(Read along with Figure above)

SIDE PLATE FOR SINGLE SHEAVE PULLEY BLOCK
(ALL DIMENSIONS ARE IN mm)

Pulley Designation	A	B	C	D	E	F	G	H	J	K	L
S65X10	132	64	44	11	13	73	6	13	8	13	3
S90X14	165	76	60	14	15	100	8	13	10	14	3
S120X20	220	105	80	16	19	128	10	19	12	18	3
S150X26	266	128	98	19	21	162	13	25	16	25	3

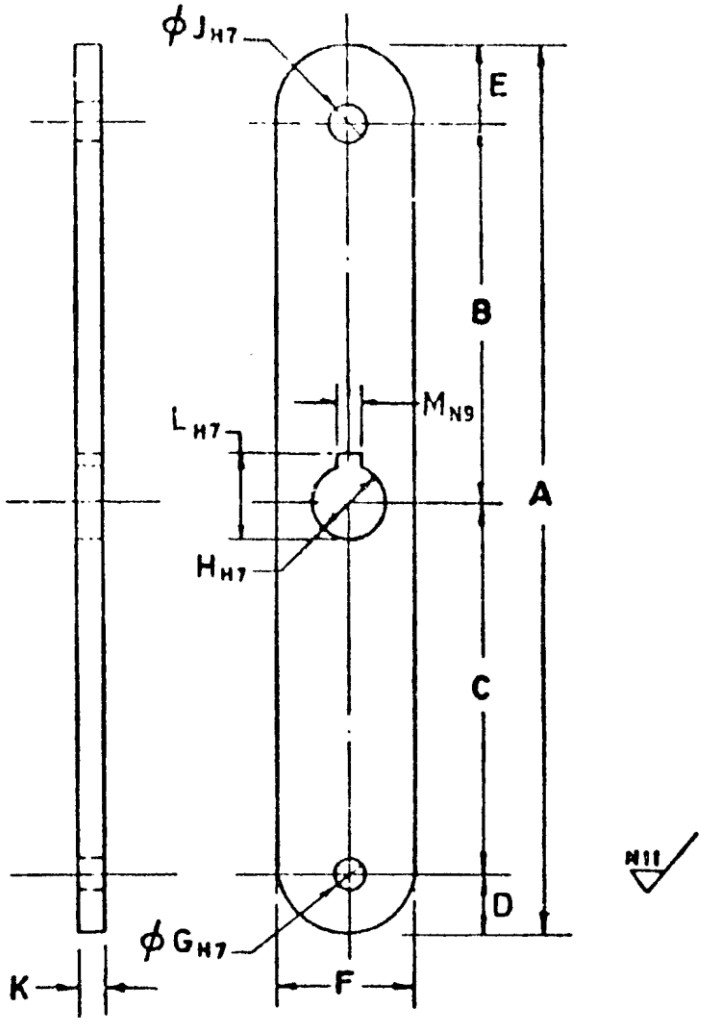


SIDE PLATE FOR DOUBLE AND TRIPPLE SHEAVE PULLEY BLOCK

TABLE – 8B
(Read along with Figure above)

SIDE PLATE FOR DOUBLE AND TRIPPLE SHEAVE PULLEY BLOCK
(ALL DIMENSIONS ARE IN mm)

Pulley Designation	A	B	C	D	E	F	G	H	J	K	L
D/T/65X10	133	64	44	11	14	73	6	13	8	13	3
D/T90X14	167	76	60	14	17	106	8	13	10	16	3
D/T120X20	226	105	80	16	25	129	10	19	12	19	3
D/T150X26	271	125	98	19	29	162	12	25	16	25	3
D/T205X40	349	168	124	25	32	210	12	32	22	25	3

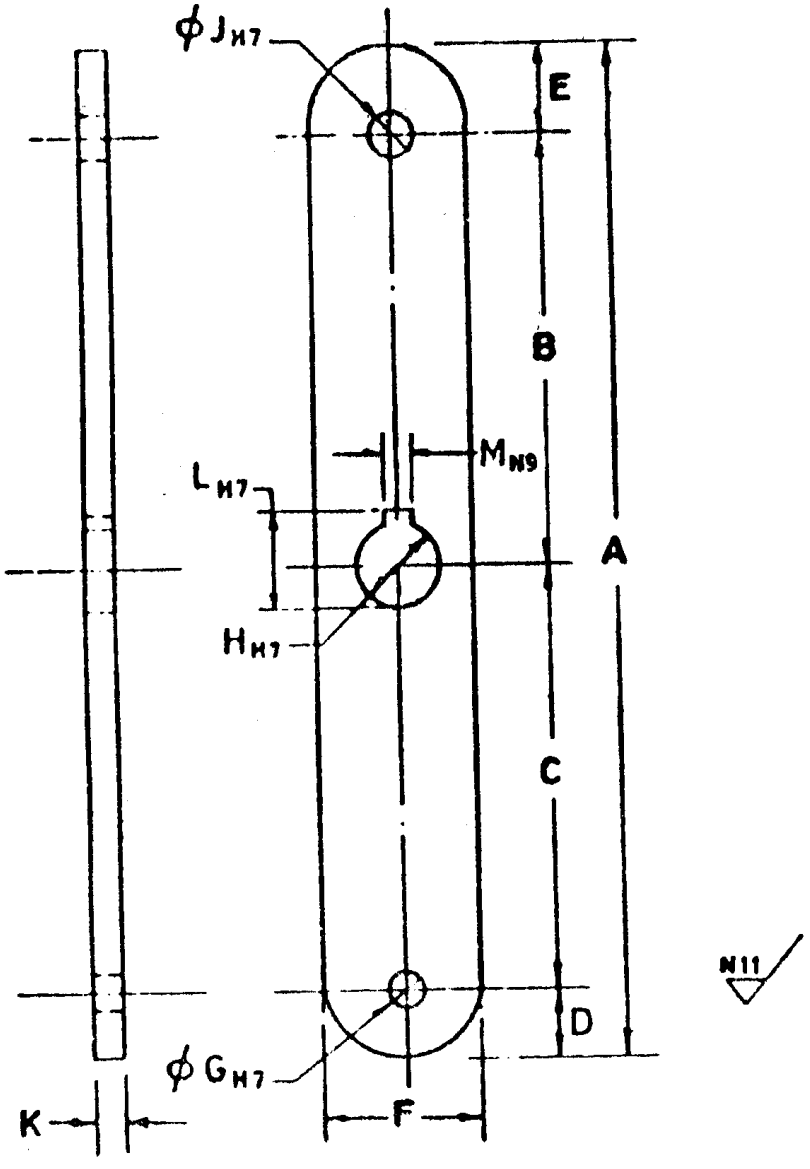


SIDE STRAP FOR SINGLE SHEAVE PULLEY BLOCK

TABLE – 9A
(Read along with Figure above)

SIDE STRAP FOR SINGLE SHEAVE PULLEY BLOCK
(ALL DIMENSIONS ARE IN mm)

Pulley Designation	A	B	C	D	E	F	G	H	J	K	L	M
S65X10	---------- NO SIDE STRAP ----------											
S90X14	165	76	60	14	15	25	8	13	10	5	16	3
S120X20	220	105	80	16	19	38	10	19	12	5	22	5
S150X26	266	128	98	19	21	51	13	25	16	6	28	5



SIDE STRAP FOR DOUBLE AND TRIPPLE SHEAVE PULLEY BLOCK

TABLE – 8B
(Read along with Figure above)

SIDE STRAP FOR DOUBLE AND TRIPPLE SHEAVE PULLEY BLOCK
(ALL DIMENSIONS ARE IN mm)

Pulley Designation	A	B	C	D	E	F	G	H	J	K	L	M
D/T65X10	---------- NO SIDE STRAP ----------											
D/T90X14	167	76	60	14	17	25	8	13	10	5	16	3
D/T120X20	226	105	80	16	25	38	10	19	12	5	22	5
D/T150X26	271	125	98	19	29	51	12	25	16	6	28	5
D/T205X40	349	168	124	25	32	64	12	32	22	8	38	5

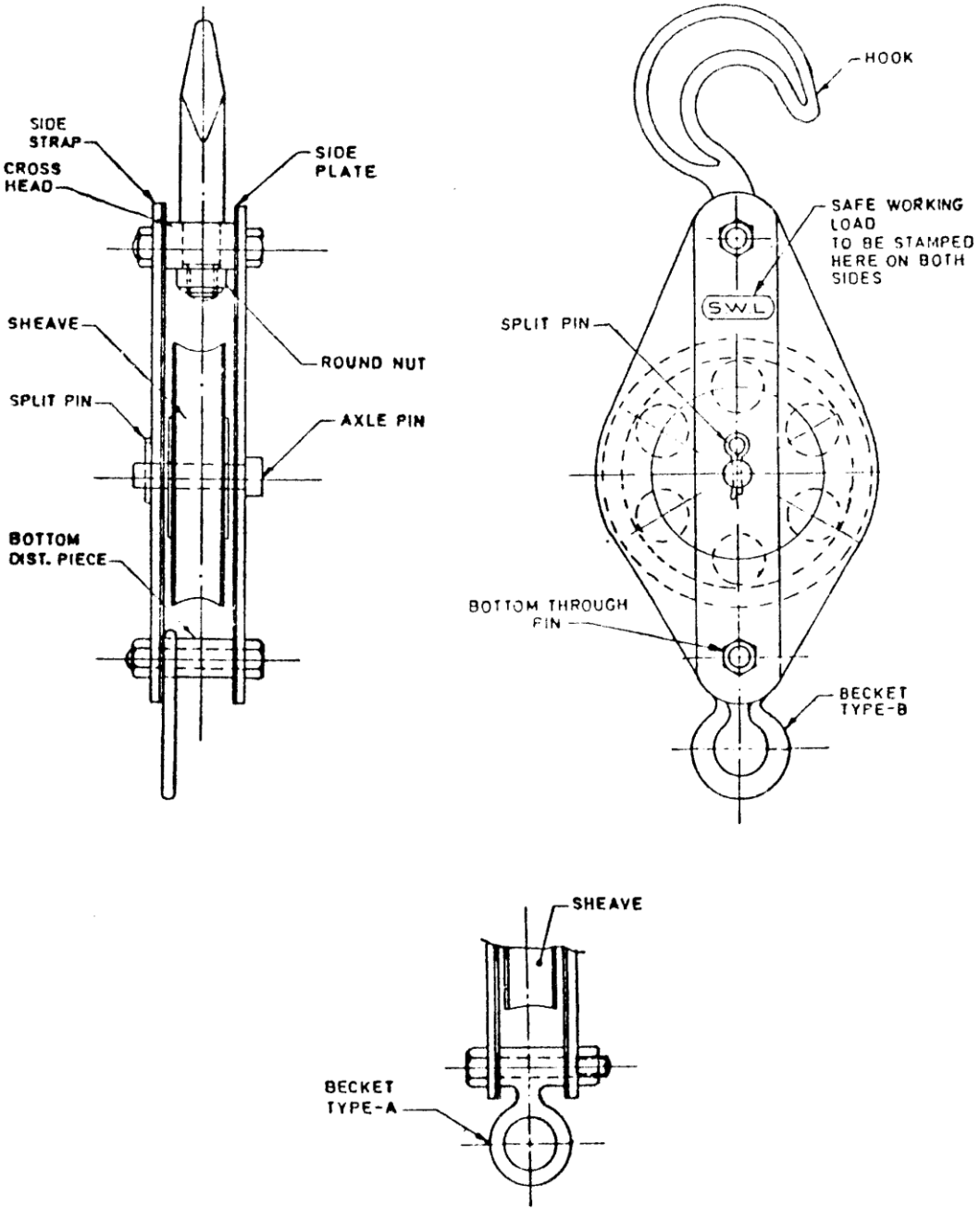


FIGURE – A
SINGLE SHEAVE PULLEY BLOCK
(FOR MATERIALS DETAILS, REFER ANNEXURE-1, PAGE 21)

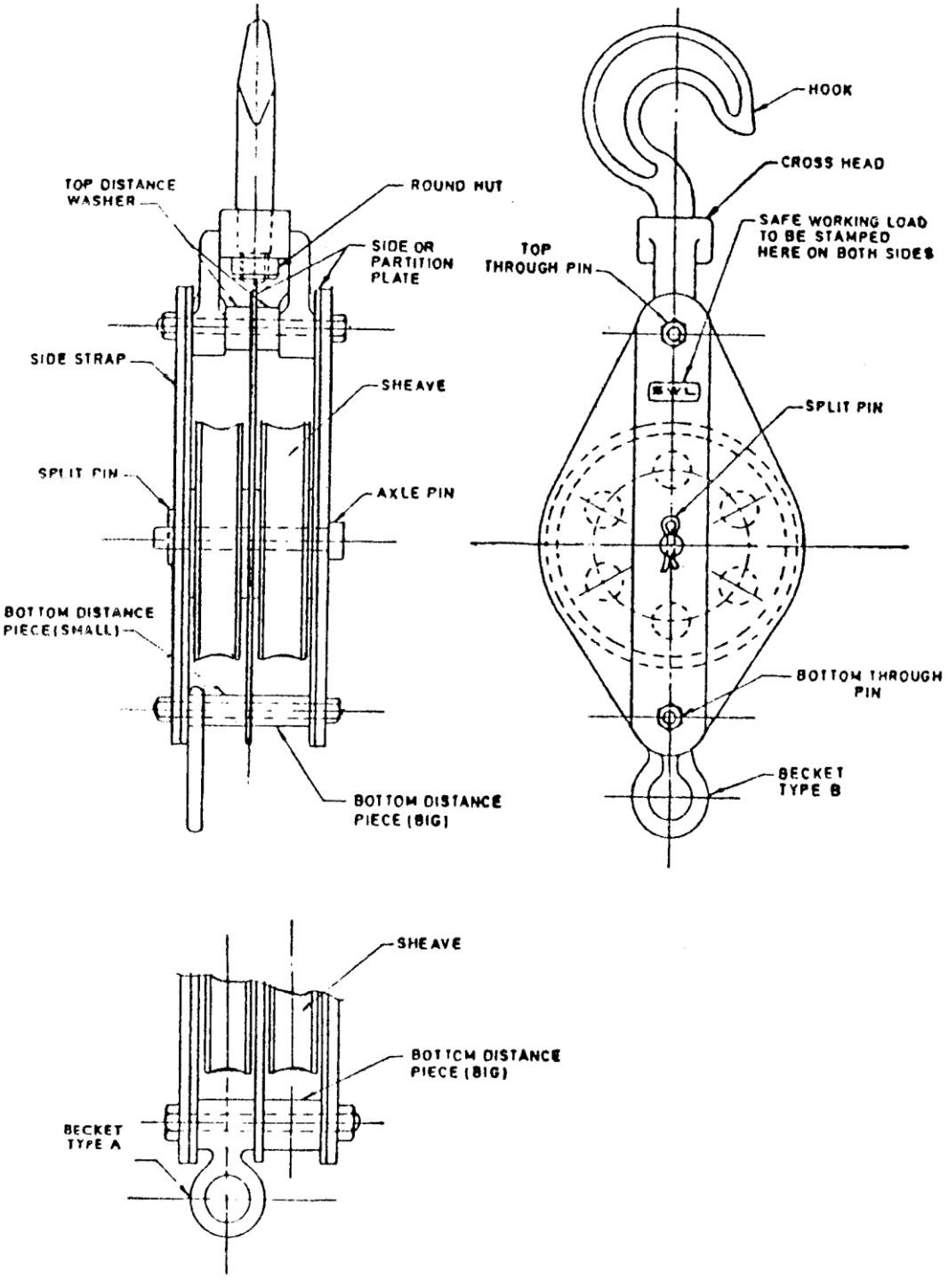


FIGURE – B
DOUBLE SHEAVE PULLEY BLOCK
(FOR MATERIALS DETAILS, REFER ANNEXURE-1, PAGE 21)

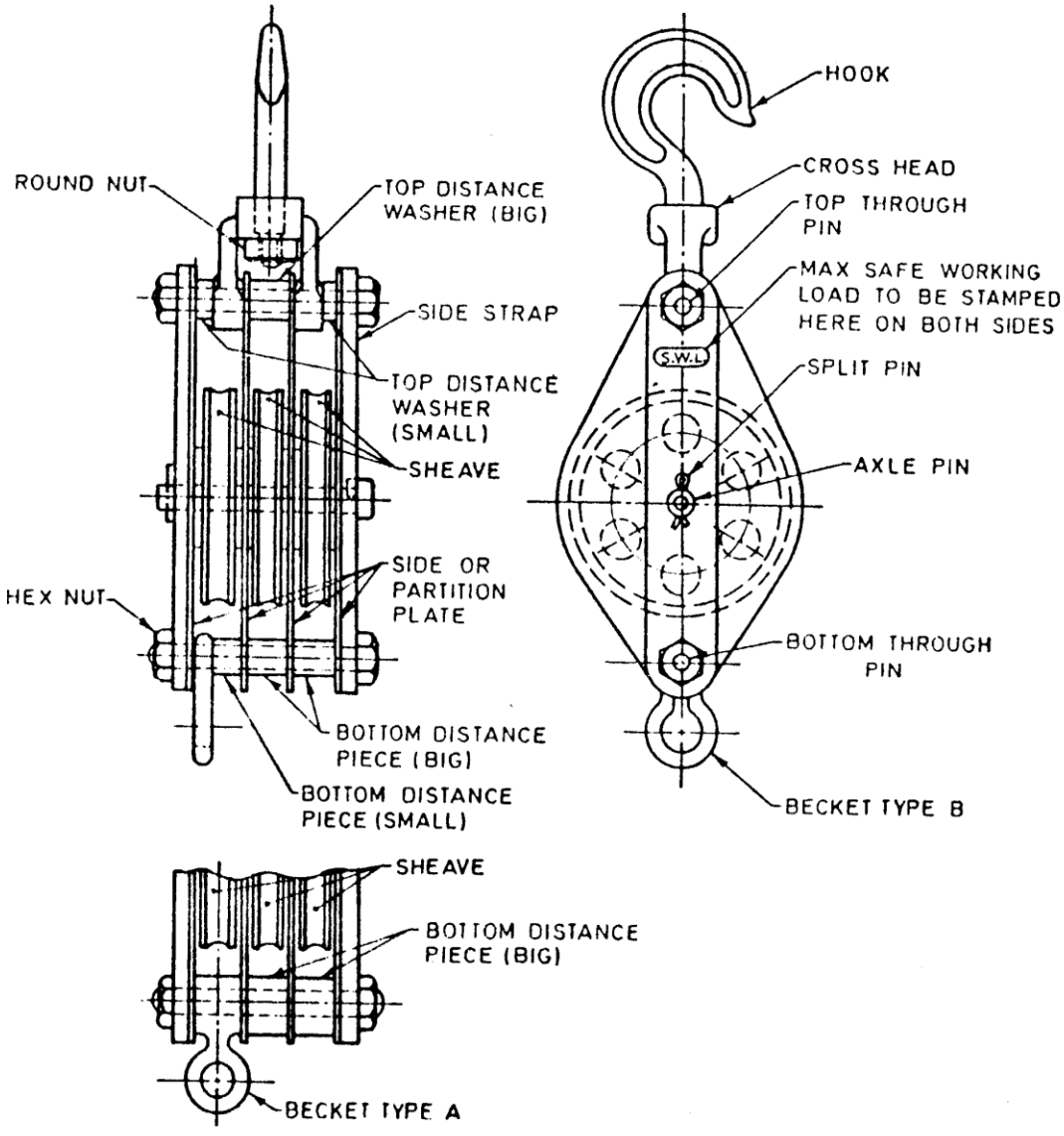


FIGURE – C
TRIPPLE SHEAVE PULLEY BLOCK
(FOR MATERIALS DETAILS, REFER ANNEXURE-1, PAGE 21)

ANNEXURE-1
(Ref Figure-A, B & C, Page 18, 19 & 20)

MATERIAL FOR COMPONENTS OF SINGLE, DOUBLE AND TRIPPLE SHEAVE PULLEY BLOCK

Sl No.	Component	Material Specification
1.	Hook	Steel forging, conforming to class 3 of IS 1875:1992 (reaffirmed in 1998) " Carbon steel, billets, blooms, slabs and bars for forging (fifth revision)". Heat treatment shall be in accordance with 7.1 (a) of IS 3815:1969 (reaffirmed in 1991).
2.	Round nut	Steel forging, conforming to class 2, IS 1875:1992 (reaffirmed in 1998) in normalized conditions.
3.	Cross head	Steel forging, conforming to class 3, IS 1875:1992 (reaffirmed in 1998) in normalized conditions.
4.	Sheaves	Gray iron castings, conforming to grade FG 200 of IS 210:1993.
5.	Bottom through pin	Steel bar, conforming to class 3A, IS 1875:1992 (reaffirmed in 1998) in normalized conditions.
6.	Bottom distance piece	Steel forging, conforming to class 3, IS 1875:1992 (reaffirmed in 1998) in normalized conditions.
7.	Top through pin	Steel bar, conforming to class 3A, IS 1875:1992 (reaffirmed in 1998) in normalized conditions.
8.	Top distance piece	Steel plate, conforming to class 3, IS 1875:1992 (reaffirmed in 1998) in normalized conditions.
9.	Axle pin	Steel bar, conforming to class 3A, IS 1875:1992 (reaffirmed in 1998) in normalized conditions.
10.	Split pin	Conforming to IS 549:1974 (reaffirmed in 1996) "Specification for split pins (second revision)".
11.	Beckets	Steel forging, conforming to class 3A, IS 1875:1992 (reaffirmed in 1998) in normalized conditions.
12.	Side strap	Grade B, IS 2062:1992
13.	Side plate / partition plate	Grade B, IS 2062:1992
14.	Hexagon nut	Steel conforming to IS 1363 (part-3):1992.

APPENDIX – A

PROFORMA FOR THE TEST CERTIFICATE

XXX & COMPANY LTD

Test Certificate Number _____

Dated _____

Item of stores; Single/Double/Tripple Sheave Pulley Blocks

Identifation no.	Designation	Maximum SWL (kg)	Proof load on block		Proof load on becket	
			Load applied Kg	Remarks after visual inspection	Load applied Kg	Remarks after visual inspection