INTERPLANT STANDARD - STEEL INDUSTRY		
IPSS	**SPECIFICATION FOR SINGLE, DOUBLE & TRIPLE SHEAVE PULLEY BLOCKS FOR WIRE ROPES** ***(SECOND REVISION)***	**IPSS:1-07-014-14** ***(SECOND REVISION)***
	BASED ON IS:13156-1991	Formerly-: IPSS:1-07-014-95 *(First Revision)*

0. FOREWORD

0.1 This Inter Plant Standard, prepared by the Standards Committee on Paints and Portable Maintenance Equipment, IPSS 1:7, with the active participation of the representatives of all the steel plants and established manufacturers of pulley blocks for wire ropes and was adopted in January 1995 with First Revision. It was revised second time in July, 2014.

0.2• The requirements of single, double and triple sheave pulley blocks of sizes varying from 160 to 350 dia for wire ropes were earlier covered in IPSS:1-07-013, 014 & 015 of 1983 respectively. Bureau of Indian Standards (BIS) formulated IS 13156:1991 exactly on the lines of IPSS Standards on the subject. This standard has been revised and covers the requirements of earlier three standards 1-07-013, 014 & 015 and additional sheave pulley blocks of sizes 400 & 450 mm dia.

1. SCOPE

1.1• This Interplant Standard covers the requirements of pulley blocks of nominal sheave sizes from 160 to 450 mm dia for wire ropes of nominal sizes from 12 to 32 mm dia.

2. TERMINOLOGY

2.1• For the purpose of this standard, the definitions given in IS 6498:1971 `Glossary of terms used in connection with pulley blocks' shall apply.

3. GENERAL REQUIREMENTS

3.1 Hooks - The hooks shall be forged in one piece and shall be of special trapezoidal section point hook conforming to IS 15560 (2005) `Specification for point hooks with shank for general engineering purposes'.

3.1.1 The shank of the end fitting shall have threads as specified in IS 4218 (Part 3):1999 `ISO metric screw threads: Part 3 Basic dimensions for design profiles (first revision)' and shall not be clinched after fixing the cross head and nut.

3.2 Cross Head - The cross head shall be neatly and cleanly dressed. The holes for the shank of the hook and through pins shall be in correct alignment and at right angle to each other.

3.3 Sheave - The sheave shall be cast smooth, free from burrs, sharp edges and other harmful defects. The sheave shall be supplied as per IS 13308:1992.

3.4 Bottom Through Pin & Bottom Distance Pieces - These shall be forged and machined. The end of the bottom through pin shall be peened over the nut.

3.5 Axle Pin - The axle pin shall be machined from a bar not less than 3 mm larger in diameter than the diameter of the head portion of the axle pin.

3.6 Beckets - The beckets shall be forged in one piece.

3.7 Side or Partition Plate - They shall be free from sharp edges, burrs and fins.

3.8 Side Strap - It shall be free from sharp edges, burrs and fins.

3.9 Head Fitting - It shall be in accordance with IS 3121:1981 `Specification for rigging screws and stretching screws'.

3.10 Top Head Gear - The top head gear shall be free to swivel in the loaded condition without twisting the loaded rope. The hook shall rotate on ball thrust bearing housed in the cross head.

3.11 A typical sketch of single, double and triple sheave pulley block is given in **Fig-1, 2 & 3** respectively.

3.12 A typical arrangements of sheave pulley blocks showing 1/1, 2/1, 2/2, 3/2 & 3/3 rig arrangements is shown in **Fig-4**• • .

4. LOAD CAPACITY

4.1• The complete block including head fittings shall be designed to withstand without visible distortion a proof load equal to atleast twice the load imposed by Safe Working Load (SWL) when the block is rigged as top block of 1/1 rig, 2/2 rig and 3/3 rig of single, double and triple sheave pulley blocks respectively.

4.2• The value of safe working loads (SWL) per single part of rope and of rigs for single, double and triple sheave pulley blocks shall be as given in **Table-2, 3 & 4 (see page 9)** respectively.

5. MATERIAL

5.1• The material for component parts of the pulley blocks shall be as specified in Table-1• (see page 7).

6. FACTOR OF SAFETY

6.1 The factor of safety for hook and other suspension fitting shall not be less than 5.

7. **LOAD TEST**

7.1 The block shall be tested for the proof load twice the SWL.

7.2• After proof testing, all parts of the blocks shall be thoroughly examined. The shank of the hook and sheaves shall rotate freely by hand and block shall be free from deformation, cracks, flaws and any other defects.

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

8. **DESIGNATION**

8.1• The designation of the sheave pulley blocks shall indicate the sheave and rope diameters with a prefix `S' for single sheave pulley block, `D' for double sheave pulley block `T' for triple sheave pulley block and the number of this standard.

EXAMPLE : A double sheave pulley block of size 200 with a rope dia of 14 mm shall be designated as

D 200 x 14 IPSS:1-07-014-14

9. **MARKING**

9.1 The following information shall be legibly and permanently marked on the blocks:

a) Name of the manufacturer or his trade-mark,
b) Designation of the block,
c) Maximum safe working load in kN, and
d) Identification number of the block.

10. **TEST CERTIFICATE**

10.1• The manufacturer/supplier shall supply a test certificate for compliance of each pulley block with the provision of this standard. If required by the purchaser, one random sample from every batch shall be tested by a recognized test house and the test certificate shall be provided with every supply.

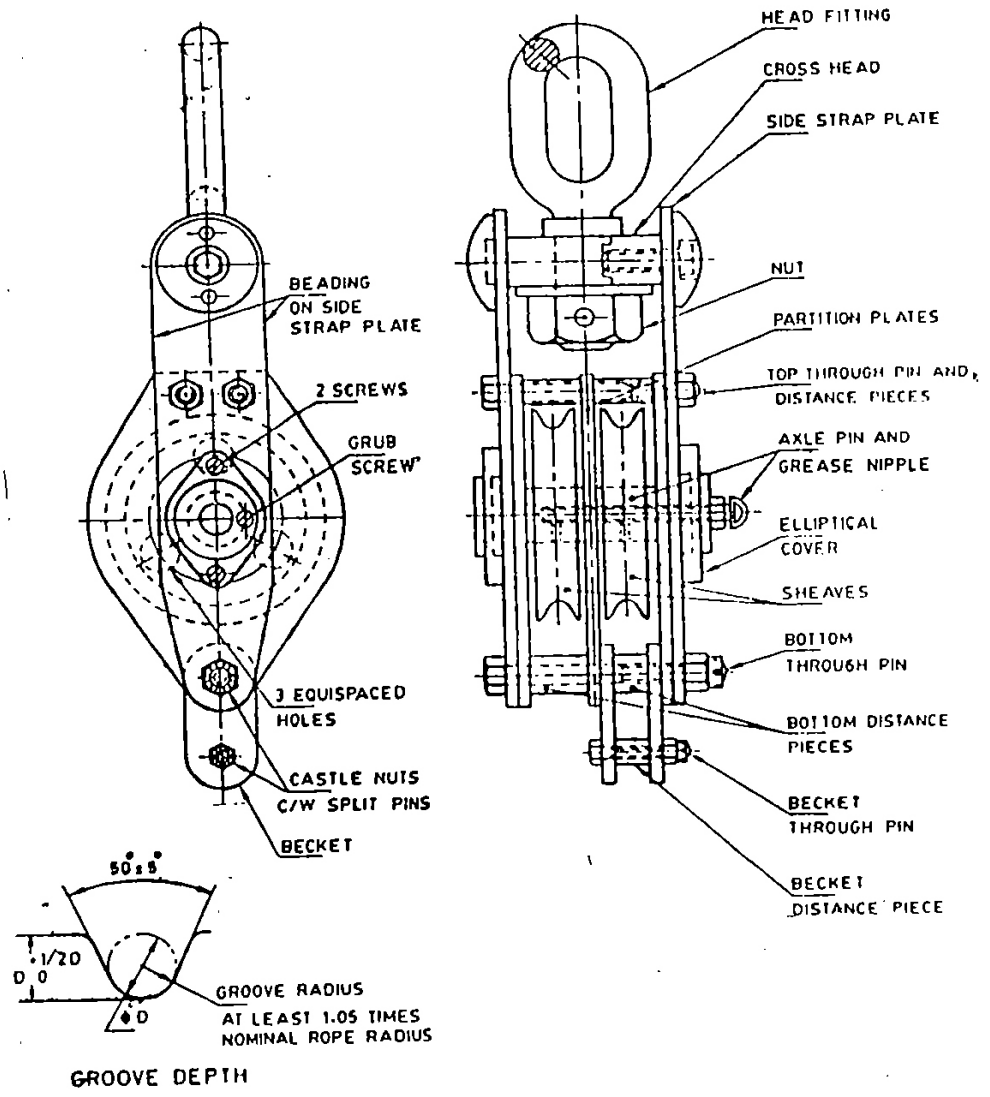

FIG. 2 DOUBLE SHEAVE PULLEY BLOCK

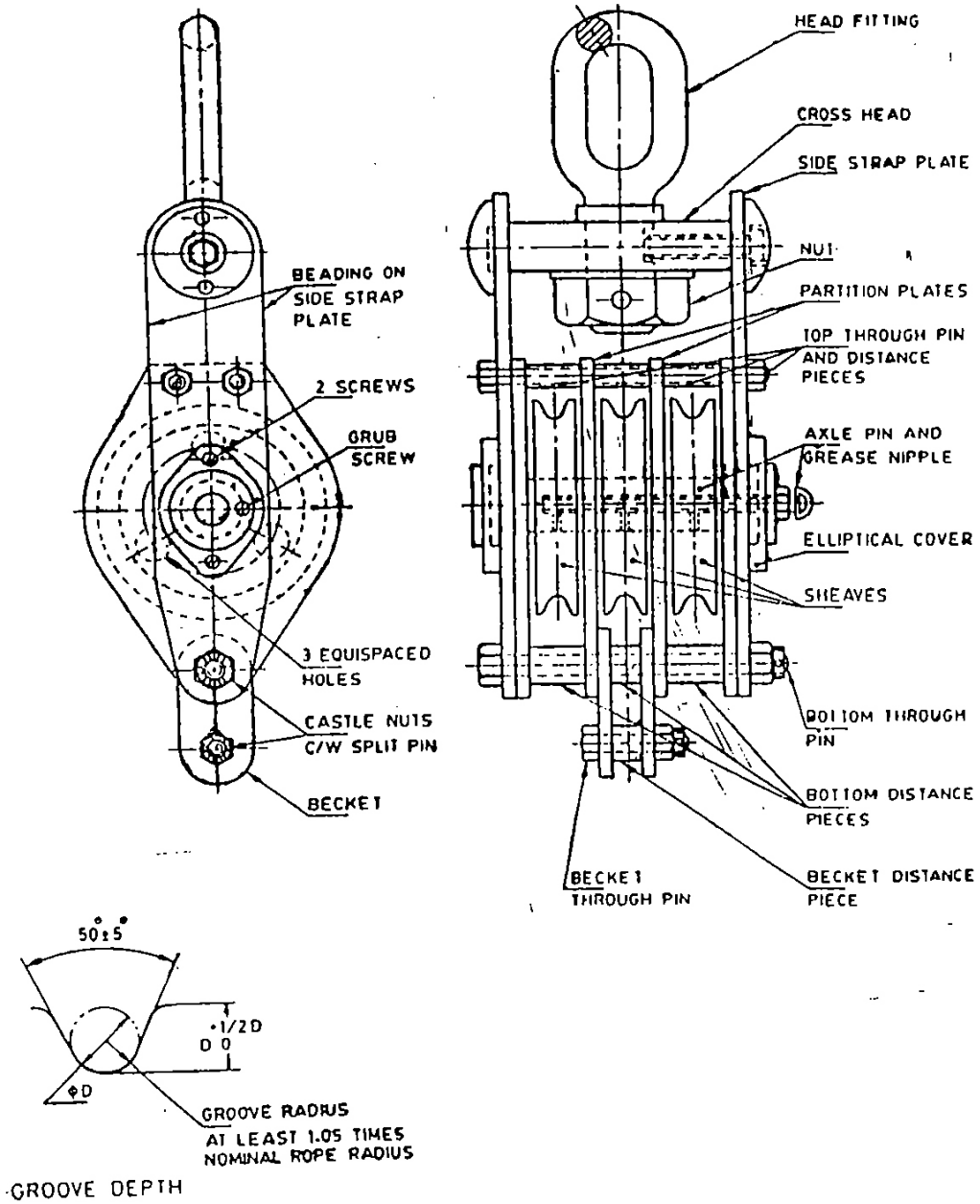

FIG. 3 TRIPLE SHEAVE PULLEY BLOCK

TABLE – 1

MATERIAL FOR COMPONENTS

Sl. No.	Component	Material Specification
1.	Hook	Steel forging, conforming to Class 3 of IS 1875:1992 `Carbon steel billets, blooms, slabs & bars for forgings (fifth revision)'. Heat treatment shall be in accordance with 7.1 (a) of IS 15560(2005)
2.	Round nut	Steel forging, conforming to Class 2, IS 1875:1992 in normalized conditions
3.	Cross head	Steel forging, conforming to Class 3, IS 1875:1992 in normalized conditions
4.	Sheaves	Grey iron castings, conforming to Grade FG 200 of IS 210 (2009)
5.	Bottom through pin	Steel forging bar, conforming to Class 3A, IS 1875:1992 in normalized conditions
6.	Bottom distance pieces	Steel forging, conforming to Class 3, IS 1875:1992 in normalized conditions
7.	Top through pin	Steel forging bar, conforming to Class 3A, IS 1875:1992 in normalized conditions
8.	Top distance washer	Steel plate, conforming to Class 3, IS 1875:1992 in normalized conditions
9.	Axle pin	Steel forging bar, conforming to Class 3A, IS 1875:1992 in normalized conditions
10.	Split pin	Conforming to IS 549:2005 `Specification for split pins (second revision)'
11.	Beckets	Steel forging, conforming to Class 3A, IS 1875:1992 in normalized conditions
12.	Side strap	Grade B, IS 2062:2011
13.	Side or partition plate	Grade B, IS 2062:2011

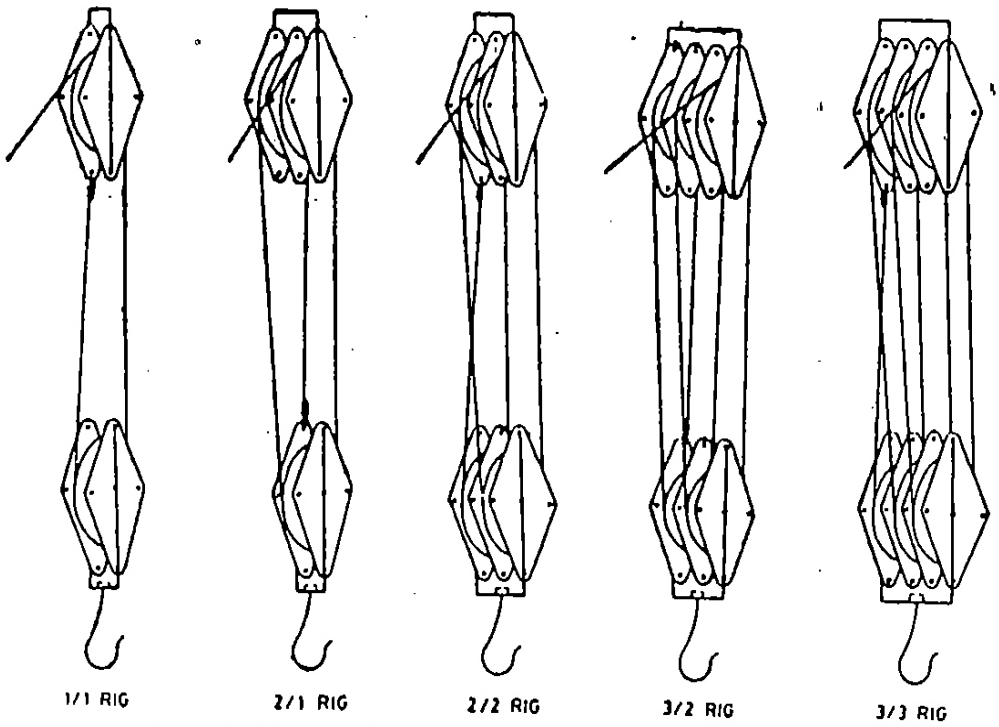

FIG. 4 TYPICAL ARRANGEMENT OF SHEAVE PULLEY BLOCKS

TABLE 2• SAFE WORKING LOADS (SINGLE SHEAVE PULLEY BLOCKS)

Sl No.	Designation of Pulley Block	Pulley Size mm	Rope dia mm	SWL per Single Part of Rope, kN	SWL of 1/1 Rig, kN
1.	S 160 X 12	160	12	10	20
2.	S 200 X 14	200	14	15	30
3.	S 250 X 16	250	16	20	40
4.	S 300 X 20	300	20	30	60
5.	S 350 X 22	350	22	40	80
6.	S 400 X 26	400	26	60	120
7.	S 450 X 32	450	32	100	200

TABLE 3• SAFE WORKING LOADS (DOUBLE SHEAVE PULLEY BLOCKS)

Sl No.	Designation of Pulley Block	Pulley Size mm	Rope dia mm	SWL per Single Part of Rope,kN	SWL of Rigs(kN) 2/1 Rig	2/2 Rig
1.	D 160 X 12	160	12	10	30	40
2.	D 200 X 14	200	14	15	45	60
3.	D 250 X 16	250	16	20	60	80
4.	D 300 X 20	300	20	30	90	120
5.	D 350 X 22	350	22	40	120	160
6.	D 400 X 26	400	26	60	180	240
7.	D 450 X 32	450	32	100	300	400

TABLE 4• SAFE WORKING LOADS (TRIPLE SHEAVE PULLEY BLOCKS)

Sl No.	Designation of Pulley Block	Pulley Size mm	Rope dia mm	SWL per Single Part of Rope,kN	SWL of Rigs(kN) 3/2 Rig	3/3 Rig
1.	T 160 X 12	160	12	10	50	60
	T 160 X 13•	160	13*	10	50	60
2.	T 200 X 14	200	14	15	75	90
3.	T 250 X 16	250	16	20	100	120
4.	T 300 X 19•	300	19*	30	150	180
	T 300 X 20	300	20	30	150	180
5.	T 350 X 22	350	22	40	200	240
6.	T 400 X 26	400	26	60	300	360
7.	T 450 X 32	450	32	100	500	600

* Non-preferred size