

WIRE ROPE PULLEY BLOCKS

Pulley blocks are part of the 'block and tackle system', one of the six classical machines systems in mechanics. A simple (or classical) machine is defined as a mechanical device that changes the direction or magnitude of a force by virtue of the principle of 'mechanical advantage'. The mechanics of pulleys were written about extensively in antiquity as such writers by Archimedes and later by the Renaissance philosophers.

Pulley systems are employed for the lifting of heavy weights. Consequently, they are commonly employed in:

- Sail boat rigging
- Tow trucks
- Elevators
- Hoists and cranes (construction industry)
- Underground mining (hoists)
- Anchors of ships
- Raising water from wells

Pulley blocks are generally employed as a set of two or more with rope or cable threaded between them (through grooves called 'sheaves'; singular 'sheaf'), such that one is fixed and the other moves with the load. The entire assemblage – block, the ropes or cable and the load to be lifted – comprises the pulley system. As the number of blocks in the system increases, so, too, does the number of pulleys, and with it, the mechanical advantage.

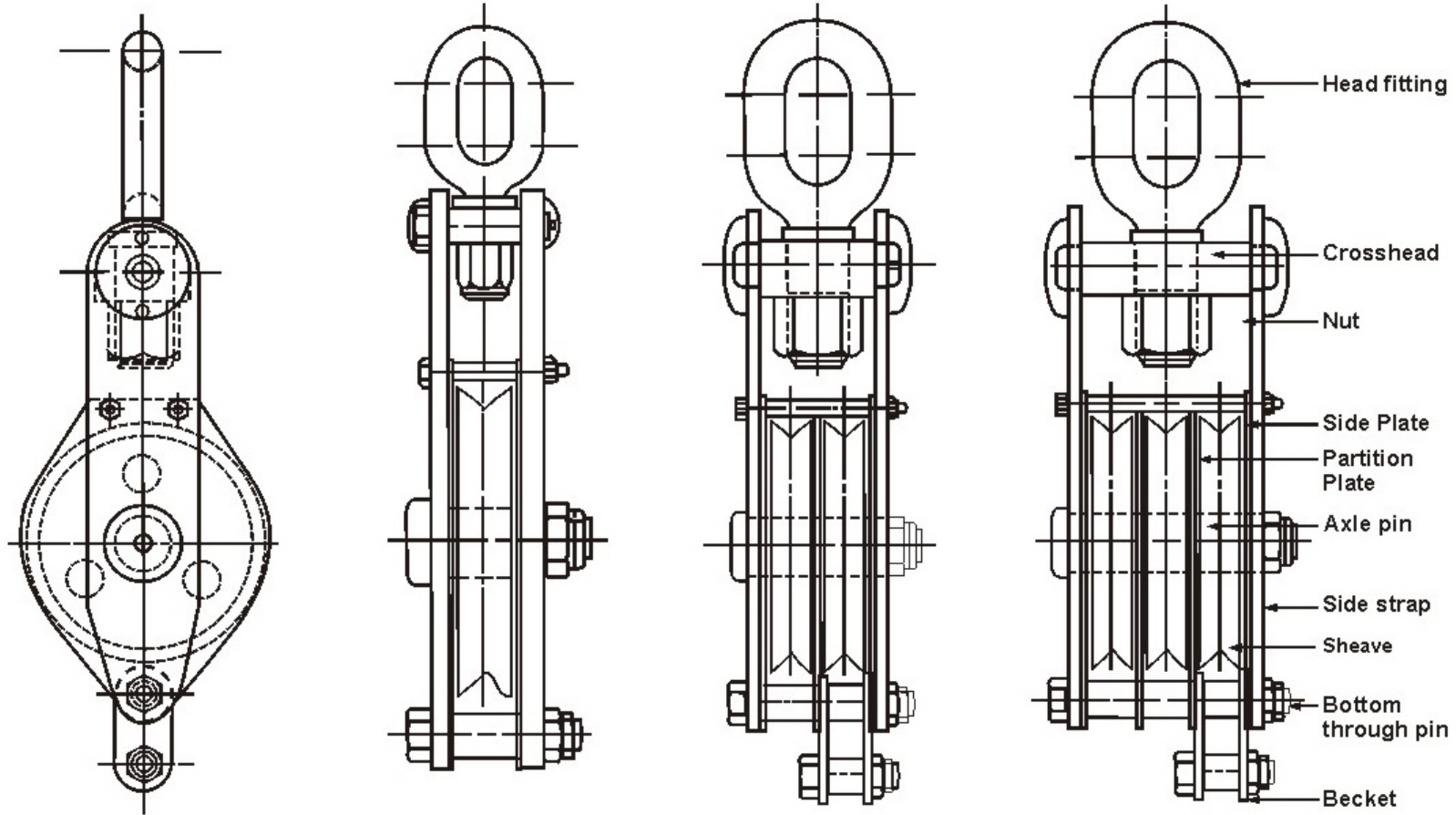
Pulley blocks are nothing more than grooved (the grooves are called sheaves) wheels on a fixed axle onto which passes a continuous length of rope, cable or wire. The number of sheaves determines the kind of block.

In terms of whether the blocks are movable or fixed in relation to the load, pulleys can be differentiated into:

- **Fixed:** A fixed pulley has an axle mounted in bearings attached to a supporting structure. A fixed pulley changes the direction of the force on a rope or belt that moves along its circumference. Mechanical advantage is gained by combining a fixed pulley with a movable pulley or another fixed pulley of a different diameter.
- **Movable:** A movable pulley has an axle in a movable block. A single movable pulley is supported by two parts of the same rope and has a mechanical advantage of two.
- **Compound:** A combination of fixed and movable pulleys forms a block and tackle. A block and tackle can have several pulleys mounted on the fixed and moving axles, further increasing the mechanical advantage. The block and tackle system or the compound pulley is the most common of the pulley systems, and the one that is seen most often in industrial application.

A variation on the above types is the 'swivel eye pulley'. This pulley provides dynamic rotation (the pulley's block, which holds the pulley wheel, rotates). Oftentimes, picking up a load entails a small amount of positional adjustment for the hook which the rotating 'eye' allows for. A swivel eye pulley can be mounted on a rod, bolt, shackle, etc. Additionally, the eye of a swivel eye pulley can slide over pipes, bolts, rods.

We offer wire rope pulley blocks of single, double, triple and four sheave which cater to load carrying capacity from 1ton to 100tons. Typically wire rope pulley blocks have drop forged swivel eyes on top and C.I. casted pulleys or steel pulleys. The swivel eye provides dynamic rotation and allows positional adjustment for the hook. A swivel eye pulley can be mounted on a rod, bolt, shackle, etc. Additionally, the eye of a swivel eye pulley can slide over pipes, bolts, rods, etc.

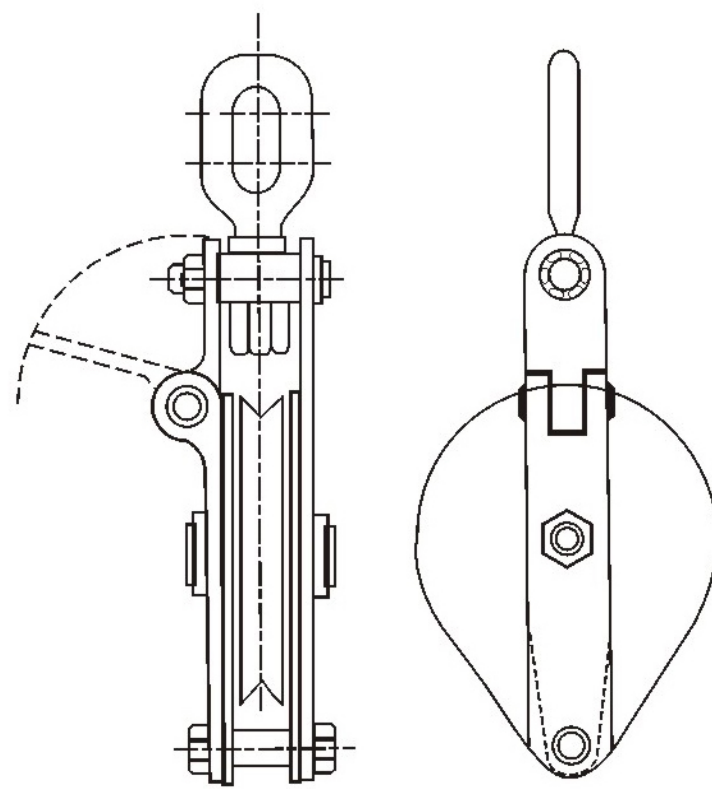


GENERAL SIDE VIEW

SINGLE SHEAVE

DOUBLE SHEAVE

TRIPLE SHEAVE



SINGLE SNATCH

Heavy duty with swivel oval/round eye head and becket arrangement. The body is a mild steel; swivel oval eye, cross head of forged steel; axle pin of steel bar and sheaves of grey iron casting(grade 10 or 12) with gun metal bush bearing.

SPECIFICATIONS:

PULLEY BLOCK FOR WIRE ROPES WITH DROP FORGED SWIVEL EYE ON TOP & C.I. PULLEY FITTED WITH G.M. BUSHING & SELF LUBRICATING SYSTEM GREASE NIPPLE, HIGH TENSILE PIN WITH TEST CERTIFICATE				
Size (in inches)	Single Sheave	Double Sheave	Triple Sheave	Four Sheaves
	Capacity (in tons)			
6 x ½	1.5	3	3.5	6
8 x ⅝	2.5	5	7.5	10
10 x ¾	3	5	9	12
12 x 1	5	10	15	25
14 x 1¼	10	15	20	35
16 x 1½	15	20	25	50

Note: Higher Capacity Pulley Blocks manufactured against order.

Safe Working Load Of Wire Rope Pulley Blocks as per BS 4018-1966									
Diameter Of Sheave		6"	7"	8"	10"	12"	14"	16"	18"
Circumference of Rope		1"-1 1/4"	1 1/4"-1 1/2"	1 1/2"-2 1/4"	1 3/4"-1 1/7"	2 1/4"-1 1/8"	2 1/2"-3"	3"-3 1/2"	3 1/2 - 4"
Safe Working Load (in tons)	Single Sheave	0.75	1.5	2	3	5	6	7	10
	Double Sheave	1	2	3	5	8	10	15	20
	Triple Sheave	1.5	2.5	5	10	12	15	20	25

The manner of test specified in Schedule 2 of the Dock Workers (Safety, Health and Welfare) Regulations, 1990 is as follows:

Articles of Gear	Proof Load
Single Sheave Pulley Block	[Safe Working Load] × 4
Multiple Sheave Block with Safe Working Load equal to or less than 20 Tons (x ≤ 20 tons)	[SWL] × 2
Multiple Sheave Block with Safe Working Load more than 20 tons but up to 40 Tons (x >20; x ≤ 40)	SWL + 20 tons
Multiple Sheave Block with Safe Working Load more the 40 Tons (x ≥ 40)	[SWL] × 1.5

Selection Criteria

Sheave Diameter / Rope Diameter = 12 (at least)

The Safe Working Load (SWL) per single part of rope is approx. one sixth (1/6th) of the nominal breaking load of rope as specified in B.S. 302 621 in the 6 x 36 group of tensile strength 1770/1960 N/mm sq. This is the nominal breaking load on which the design of blocks to this standard is set.



FIG:1 THREE SHEAVE - PULLEY BLOCK IN USE



FIG:1 SIX SHEAVE - WIRE ROPE PULLEY BLOCK