## BLOCK CONCEPTS

MECHANICAL ADVANTAGE

MECHANICAL ADVANTAGE IS THE LEVERAGE GAINED BY A MULTIPLE PART BLOCK.

THE THEORETICAL (IGNORE FRICTION) ADVANTAGE IS EQUAL TO THE NUMBER OF PARTS OF LINE SUPPORTING THE TRAVELING BLOCK (LOAD).

TOTAL LOAD ON THE BLOCK IS SUM OF ALL LOADS PLACED ON THE BLOCK END FITTING.

EXAMPLE

PARTS OF LINE = 4
MECHANICAL ADVANTAGE = 4
LINE PULL REQUIRED = 6000/4 = 1500LBS.
LOWER BLOCK LOAD = 6000 LBS.
REQUIRED W.L.L. = 6000 LBS.
UPPER BLOCK LOAD = 6000 + LINE PULL + GEAR
          = 6000 + 1500 + GEAR = 7500 LBS. PLUS
REQUIRED W.L.L. = 7500 LBS. PLUS

**6000 lbs**
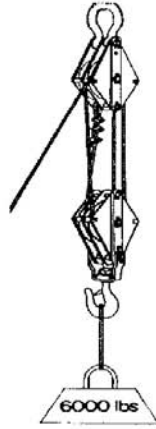
ANGLE FACTOR MULTIPLIERS

| ANGLE	FACTOR	ANGLE	FACTOR
0°	2.00	100°	1.29
10°	1.99	110°	1.15
20°	1.97	120°	1.00
30°	1.93	130°	.84
40°	1.87	135°	.76
45°	1.84	140°	.68
50°	1.81	150°	.52
60°	1.73	160°	.35
70°	1.64	170°	.17
80°	1.53	180°	.00
90°	1.41	—	—

A SINGLE LINE SNATCH BLOCK USED TO CHANGE LOAD LINE DIRECTION CAN BE SUBJECTED TO TOTAL LOADS GREATLY DIFFERENT FROM THE LINE PULL.

TOTAL LOAD = LINE PULL TIMES ANGLE FACTOR MULTIPLIER

TOTAL LOAD

ANGLE

LINE PULL   LINE PULL
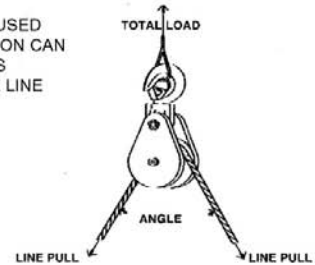
WORKING WITH BLOCKS

OVERHAUL WEIGHT
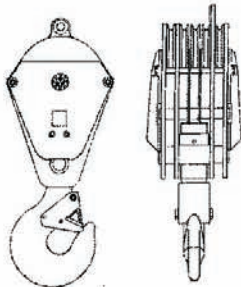
To determine the weight of the block or overhaul ball that is required to free fall the block, the following information is needed: **Size of wire rope, Number of line parts, Type of sheave bearing, Length of crane boom, and Drum Friction.**
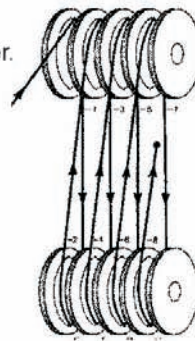
BLOCK REEVING

Straight laced reeving is a basic method of placing the rope through a set of blocks. The end of the rope is fed through the outside sheave of the upper block to the outside sheave of the lower (traveling) block. This continues to the last sheave.
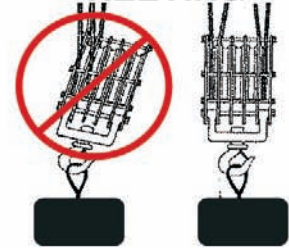
ADVANTAGES:
1. Allows blocks to run closer together.
2. Is simple.
3. Has no reverse bends.

DRAWBACKS:
Tilting because of imbalanced loading can cause block rotation and wear of the sheaves and wire rope

SYMMETRICAL REEVING

Reeve blocks symmetrically to distribute load evenly. All sheaves must be reeved to achieve the full working load limit of the block.

BLOCK CABLING

1. Reduce wire rope length
2. Use even part reeving
3. Dead end to boom
4. Evaluate wire rope construction