

# IM-89-04

## ACCIDENT PREVENTION DIVISION TECHNICAL SERVICES SECTION

### TECHNICAL INFORMATION

Record No: IM-89-04

March 1, 1989

INDEX: TRIPOD, RESCUE-DESCEND STANDARDS

SUBJECT: Standards for the Design and Use of Tripods

When tripods, davit arms and similar lowering equipment are used for lowering people, or for rescue and similar purposes, they are considered temporary elevated work platforms (scaffolds) and must meet the following requirements.

Both required and recommended requirements are listed. Recommendations are indicated by an asterisk (\*).

#### (A) The Tripod or Davit Arm

1. The tripod shall have feet so as to be adjustable for varying footing conditions and be capable of carrying all imposed loads. (437-02-1910.28 (a)(2) or 437-03-1926.451 (a)(2))
2. The legs or support arm shall be ridged and designed so as to prevent movement at the tripod when loaded. (437-02-1910.28 (a)(14) or 437-03-1926.451 (a)(2))
3. The tripod or davit shall be capable of supporting its design working load at a 4 to 1 safety factor. (437-02-1910.28 (a)(4) or 437-03-1926.451 (a)(7))
4. Tripods and davits used for raising or lowering personnel shall be capable of supporting a 5,000 pound dead load. (437-02-125 (4) or 437-03-1926.104 (b))
5. The tripod or davit shall be equipped with two separate tie off rings connected to a support bracket at the top of the tripod or davit. The rings must be capable of supporting a 5,000 pound load. (437-02-125(4) or 437-03-1926.104 (b))
6. All tripod or davit systems tested by a national testing lab as a complete unit are considered in compliance with OR-OSHA's rules for their listing. (437-02-1910.28 (i))

#### (B) Lines

1. Lines used to lower materials are recommended to have a 4 to 1 safety factor based on the design capacity of the hoisting device, and good engineering practices.

2. The suspension line used to lower workers shall be at least 5/8 first grade manila rope or equivalent steel cable of not less than 1/4 inch size. (437-02-1910.28 (j) or 03-1926.451 (1)(2))
3. In addition to the lifting and lowering harness or seat and support line, the worker shall also be secured by a separate safety belt or harness and lifeline. Both the lifeline and lifting devices shall be connected to different tripod holding rings. (437-02-125 (4))
4. The lifeline shall be 3/4 inch manila rop or equivalent with a minimum breaking strength at 5,400 pounds (437-02-125 (7) or 437-03-1926.451 (c))

(C) Hoisting Winch

1. All hoists shall be tested and listed by a national testing lab or meet UL standard 1323-85 or an equivalent standard, UL Standard 1323-85 is as follows: (437-02-1910.28 (i) or 437-03-1926.451 (k))
  - a. Manually-powered hoist shall not exceed a descent speed of 35 feet per minute.
  - b. All hoists shall have a manual crank and be operable by one person.
  - c. Manually-powered hoists shall be equipped with a drive pawl and a locking pawl that will automatically engage when the driving pawl is released during the operation of the hoist.
  - d. Manual hoists shall be equipped with a means to prevent rapid handle movement, fast unspooling, or uncontrolled descent (over 35 feet per minute).
  - e. Manual hoists shall be equipped with a positive crank force to raise and lower the suspended worker.
  - f. All hoists used with personnel shall have a primary and secondary braking system.

The PRIMARY BRAKE shall automatically stop the hoist and its rated load when the power or cranking motion is interrupted or discontinued.

The SECONDARY BRAKE shall automatically arrest the descent of the hoist load under overspeed conditions within 12 inches of vertical descent.

- g. All hoists shall be marked with their rated capacity and maximum rope length.

(D) Body Belt/Harness and Lanyards

1. Body belt/harness systems tested by the manufacturer in conformance with the following rules will be considered as acceptable systems that meet the requirements listed.

2. Lanyards and body belt/harness shall be a minimum of 1/2 inch nylon strapping and have a breaking strength at 5,000 pounds. (437-02-125 (10) or 437-03-1926.104 (d))
3. For lanyard systems, the lanyard length shall be six feet plus or minus two inches as measured from the fixed anchorage to the attachment on the body belt/harness. (437-02-125 (10) or 437-03-1926.104 (d))
4. The fall distance to be used in the test shall be the maximum fall distance physically permitted by the system during normal use conditions, up to a maximum free fall distance for the test weight of six feet. (437-02-125 (10))

(E) Hardware

1. All hardware except rivets shall be drop-forged or pressed steel and be cadmium plated. (437-02-125(8) or 437-03-104.(e))
2. All surfaces shall be smooth and free of sharp edges. (437-02-125 (8) or 437-03-1926.104 (e))
3. All hardware shall withstand a tensile load of 4000 pounds or greater without failure.(437-02-125 (9) or 437-03-1926.104 (f))

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