

Your Local Hi-Lo Distributor:

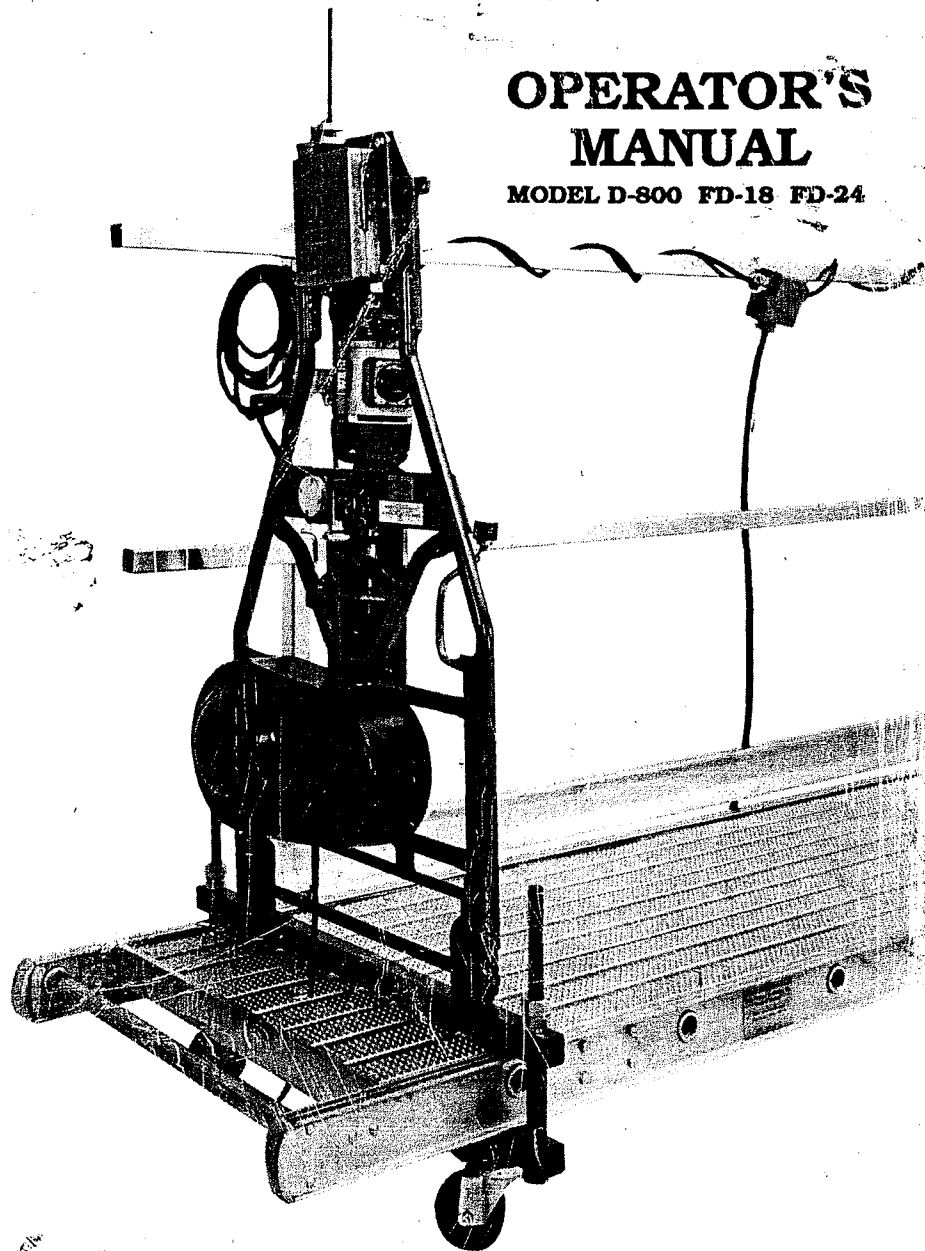
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# HI-LO / CLIMBERS

A division of L.E. ZYGMUN & Company, Inc.

## OPERATOR'S MANUAL

MODEL D-800 FD-18 FD-24



# HI-LO / CLIMBERS

A division of L.E. ZYGMUN & Company, Inc.  
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# HI-LO CLIMBERS

## WARNING:

Do not operate this equipment until you have read and fully understand this manual. Any use of this equipment other than in strict accordance with these instructions shall be at the operator's and user's own risk and may result in injury to himself and/or others.

These instructions must be kept with the hoist at the job site for ready reference when operating this equipment.

### Owner—Employer

By law the employer must insure that this manual has been given to operators and that they clearly understand and strictly abide by all the guidelines for safe usage of this equipment.

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## HI-LO CLIMBERS OPERATOR'S MANUAL

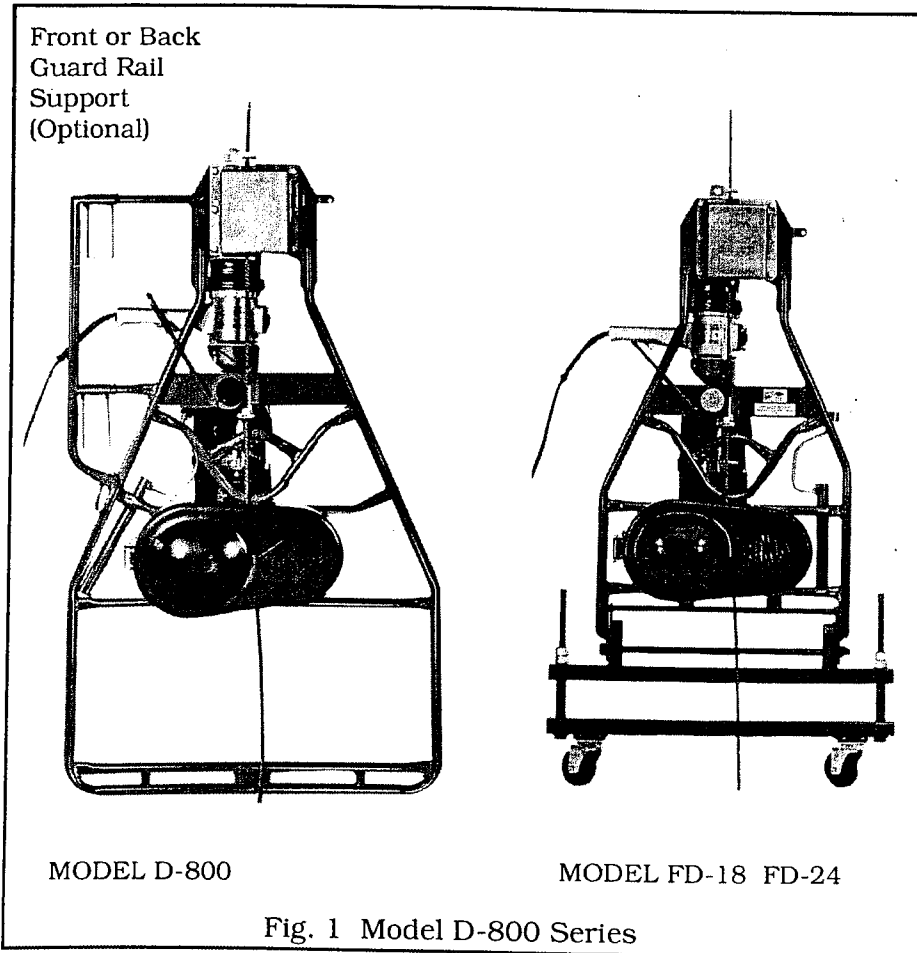
### INTRODUCTION

Hi-Lo Climbers has been making hoists for work cages and swing stages for several decades. If used and maintained as specified these hoists will perform safely and reliably for many years. Much effort has been invested in the preparation of this manual to assure your safety in operating this equipment. Read this manual carefully, especially the sections dealing with overall safety and the operation of the equipment. Be well prepared before you go up.

**NOTE:** The purpose of this manual is to inform the operator of safe and proper operation of Hi-Lo Climber units. In doing so some basic rigging procedures are included herein. Hi-Lo realizes that there are many rigging applications that will present themselves that cannot be anticipated here. It is therefore the rigger's and/or operator's responsibility to safely rig and operate the equipment in accordance with the standards of the SSFI, SIA, OSHA and all pertinent federal, state and local regulations. Some unique rigging applications will present themselves that will require professional assistance. In those instances call Hi-Lo Climbers for assistance.

# HI-LO CLIMBERS

## 1.0 DESCRIPTION & SPECIFICATIONS

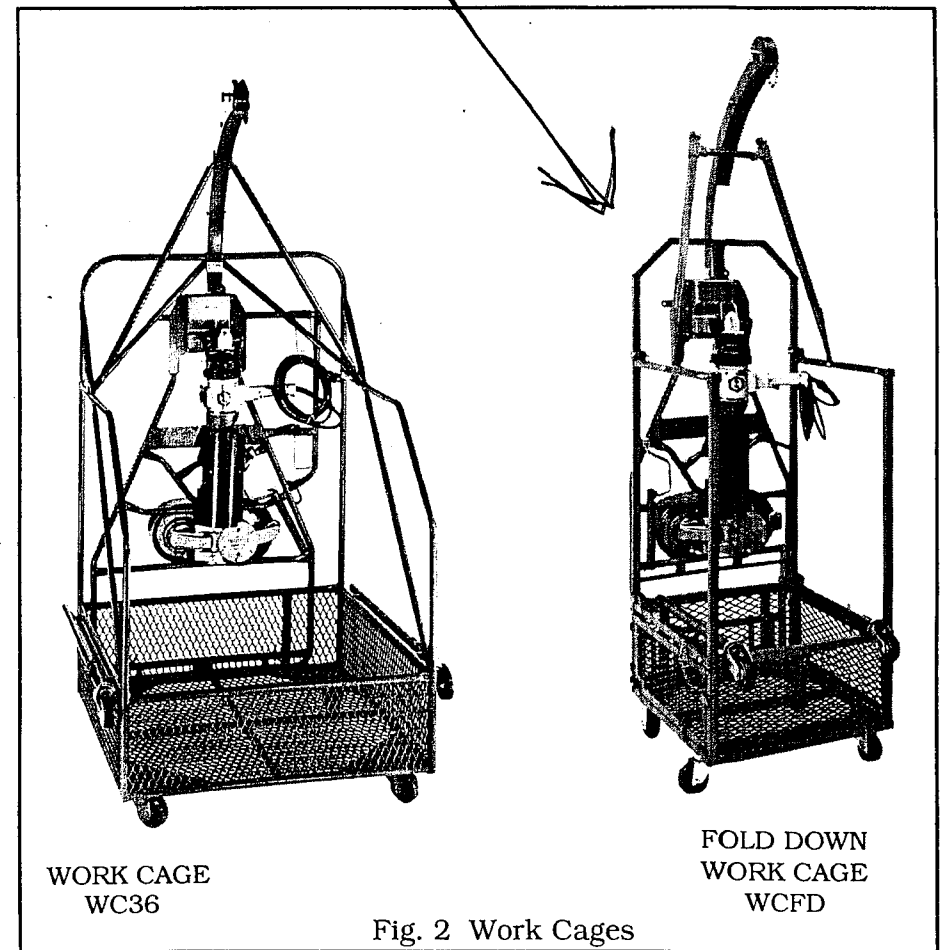


### D-800

**Load:** Rated 1000 lbs./unit.  
**Speed:** 22 FPM depending on load and power source.  
**Dim.:** 32"W x 10"D x 54"H  
**Weight:** 131 lbs.

### FD-18 FD-24

Rated 1000 lbs./unit.  
 22 FPM depending on load and power source.  
 32"W x 10"D x 61"H  
 138 lbs.



**Load:** Rated 750 lbs./unit.  
**Speed:** 22 FPM depending on load and power source.  
**Dim.:** 36"W x 36"D x 87"H  
**Weight:** 165 lbs.

Rated 500 lbs./unit.  
 22 FPM depending on load and power source.  
 24"W x 24"D x 87"H  
 130 lbs.

# HI-LO CLIMBERS

## 1.0 DESCRIPTION & SPECIFICATIONS

### 1. SPECIFICATIONS

- a. **Electric Power Operation**—This equipment uses a universal type, 5/8" extra heavy duty motor requiring 110 Volt, Single Phase at 15 amps (or optional 220 Volt, Single Phase at 7.5 amps). Use a minimum No. 12-3-SO electric cord or No. 10-3-SO electric cord for long leads over 250 ft.
- b. **Air Power Operation**—This equipment uses a 1-1/2 H.P. vane type air motor requiring 55 c.f.m. at 90 p.s.i. A minimum 150 c.f.m. air compressor is required to operate a pair of units.
- c. **Wire Rope**—[See Section 6.0 Wire Rope Care, and Inspection/Replacement Criteria for Wire Ropes.] Wire rope used with this equipment must conform to the following specifications: 5/16 inch diameter, 6 x 31 right regular lay; fiber core; extra improved plow steel; breaking strength 9,000 lbs.
- d. **Lube Oil**—This equipment uses 1-1/2 pints of SYNTHETIC GEAR OIL—Part No. 215-196.

### 2. SAFETY FEATURES

- a. **Overspeed Brake Assembly**—Eccentric cam locks wire rope to frame should speed become excessive; operates independently of the drive mechanism.
- b. **Manual Safety Brake**—Locks wire rope to frame when handle is released so cam will engage.
- c. **Automatic Idle**—Stops the wire rope from paying off when the unit reaches the ground or other surface such as a ledge; this eliminates the danger of upset.

- d. **Replaceable Shear Pin**—Shears automatically, stopping all upward movement if the unit is overloaded or catches on a protrusion on the way up; however, unit can still be powered down.
- e. **30 to 1 Gear Reduction**—Holds unit until power is applied.
- f. **U.L. Classified**—At 1,000 lbs. per unit in accordance with U.L. 1323.

### 3. ENGINEERING FEATURES

- a. **Open Breech**—Insert wire rope into breech at any point. No need to reeve from end of rope.
- b. **Climbs Rope**—No wire rope winding on a drum. Eliminates cable weight on unit.
- c. **Light Weight**—Complete one-piece unit can be handled and reeved by one man.
- d. **Modular Design**—Major components can be removed in minutes for maintenance or replacement.
- e. **Easily Interchangeable Drives**—Quickly and easily change drive power of the unit from electric to air or manual speed wrench for greater flexibility.

# HI-LO CLIMBERS

## 2.0 SAFETY CHECKLIST

The Hi-Lo Swing Stage System is regulated by Federal Law under the Occupational Safety and Health Act by means of Safety Standards referred to in part 1910.28 (Safety Requirements for Scaffolding.) Section G (Two-point suspension scaffolds—swinging scaffolds) from the booklet "Occupational Safety and Health Standards."

It is the operator's responsibility to thoroughly inspect the equipment before beginning operation. Keep in mind that it is your safety that is at stake. Do not assume someone else has done all the necessary inspection. Check it yourself to be sure. As the old saying goes, "It's better to be safe than sorry."

1. Know, understand and follow all federal, state and local safety codes, ordinances and regulations pertaining to suspended powered scaffolding.
2. Make sure all persons who install, operate or use this equipment read and fully understand this manual and use this equipment in strict accordance with these instructions.
3. Unauthorized persons must not be allowed to operate or use this equipment. When not in use remove motor, position stage beyond reach or use other means to prevent use by unauthorized persons.
4. Carefully check all equipment before using. Never use equipment that appears damaged or defective.
5. All hooks, parapet clamps, outriggers and anchoring devices must be tied back at right angles to the face of the building and tightly secured to a structurally sound portion of the building and support four times the intended load.
6. Counterweights must be made of a non-flowable material (no liquid-filled containers or sand bags) and be securely attached to the rear of the outrigger.
7. Weight of men, materials, components and staging must not exceed maximum payload.
8. Inspect wire rope carefully before rigging. Do not use undersize or oversize wire rope. (See Section 6.0.) Wire rope

must be inspected each day to make sure it is in safe working condition. Look for the following: kinks • birdcaging • rust and other corrosive damage • excessive heat or fire damage • electrical damage.

9. Use only recommended wire rope clips, thimbles and other hardware. Do not use "U" type wire rope clips.
10. Wire rope must be protected from sharp or abrasive edges of building protrusions or surfaces.
11. Check all clearances before moving platform up or down.
12. Always secure electric power cord to scaffolding with a cord restraint and assure all connections are properly grounded.
13. Make sure platform, toeboards, guardrails and midrails are properly secured to stirrup frame or stage.
14. Check your installation by raising the platform or cage a couple feet off the ground. Raise and lower platform to check all safeties and to become familiar with equipment operation.
15. All tools and equipment must be secured and tied off to prevent them from falling and injuring persons on the ground.
16. Operate the platform in a level position.
17. Use fall-arrest equipment attached to independent safety lines with rope grabs and lanyards at all times when working above ground. Use a lanyard and rope grabs as high on the life line as possible.
18. Life lines must be attached to structural member of the building.
19. Do not attempt to operate or otherwise use this equipment in icy conditions or other adverse weather. Accumulated ice on any part of staging and/or this equipment may affect its performance and safety and result in potential danger to the user.
20. Do not alter, remove or substitute any parts of this equipment.
21. Never attempt maintenance or replacement of parts while the unit is suspended.
22. Maintenance on Hi-Lo units must be performed only by factory authorized service representative or other qualified mechanic.

# HI-LO CLIMBERS

## 3.0 HI-LO CLIMBERS SYSTEM DESCRIPTION

The Hi-Lo Climber is a small modular hoist designed to raise or lower workmen safely and efficiently. Hi-Lo Climbers have been tested, classified by Underwriters Laboratories at 1000 lbs. per unit with a 4 to 1 safety factor. The Hi-Lo hoist is made up of five major components: 1) Stirrup frame; 2) overspeed brake assembly; 3) manual safety brake; 4) motor; 5) speed reducer.

1. **Stirrup Frame**—The all steel tubular frame is available in two types: a) a rigid frame or, b) a fold-down articulating frame. The fold-down frame enables the powered hoist to align with the wire rope to its rigging point.
2. **Overspeed Brake Assembly**—The overspeed brake trips and locks the wire rope to the frame should the unit exceed the normal travel speed for any reason.
3. **Manual Safety Brake**—The manual safety brake locks the wire rope to the frame at all times unless held open manually to allow travel. The manual safety brake prevents any uncontrolled movement. When either braking mechanism has been engaged and locked on the wire rope, the unit must be powered upward slightly to unlock the brake.
4. **Motor**—A Black and Decker electric motor or an Ingersoll-Rand air motor provides power for the unit. In the event of a power failure (electric or air) the motor is easily removed to permit the insertion of a speed wrench to manually lower the unit. Be sure speed wrench is attached.
5. **Speed Reducer**—The gear box operates on a 30 to 1 ratio from the motor to the drive pulley shaft. Once reeved and in the air the wire rope is locked into the speed reducer by the pressure of the unit's load and the self-locking fairlead.

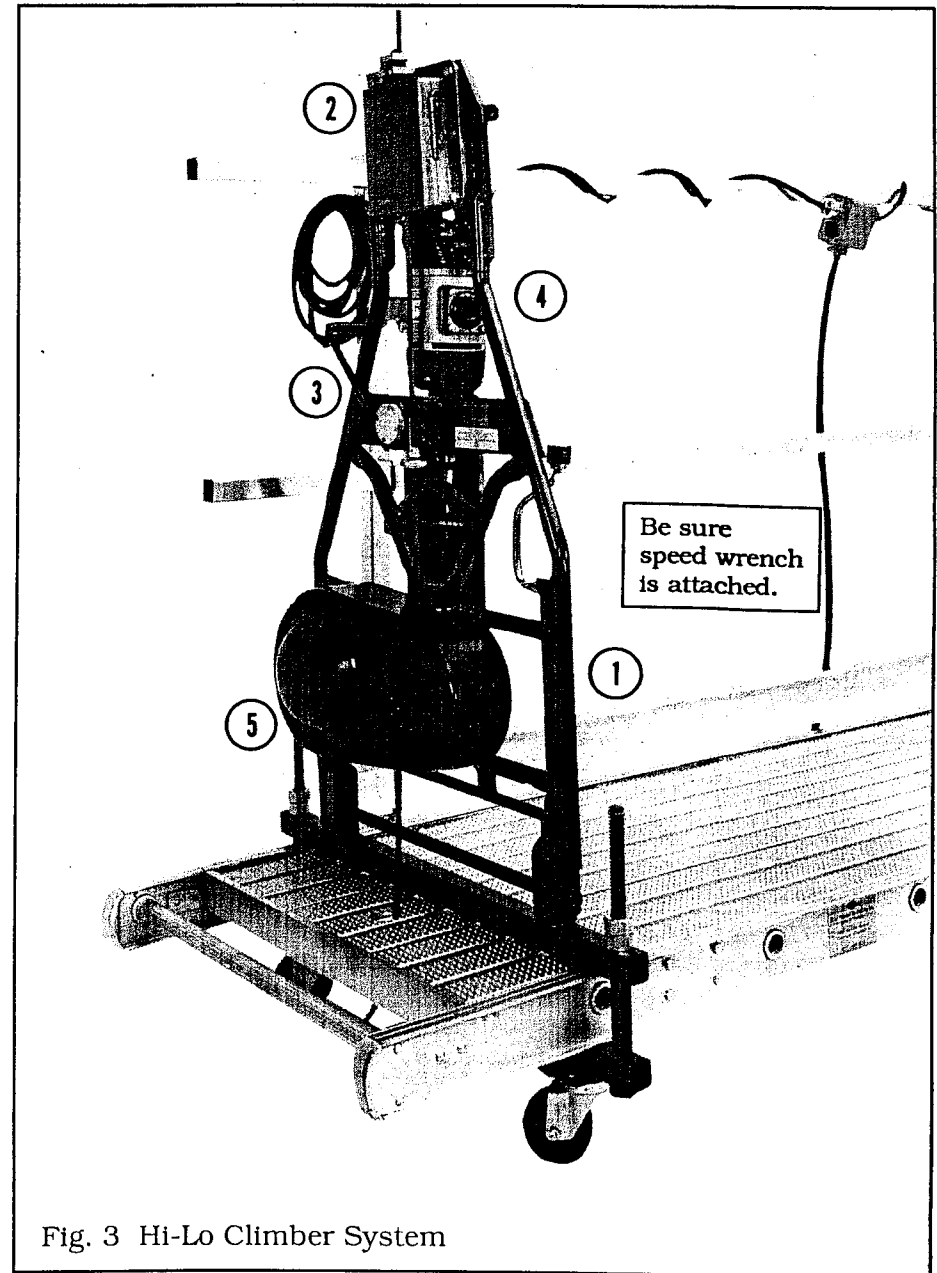


Fig. 3 Hi-Lo Climber System

## 4.0 REEVING

Always reeve the Hi-Lo unit from the top down beginning with the overspeed brake assembly and finishing with the speed reducer. [See Figs. 4, 5, and 6.]

### 1. Reeving Overspeed Brake Assembly

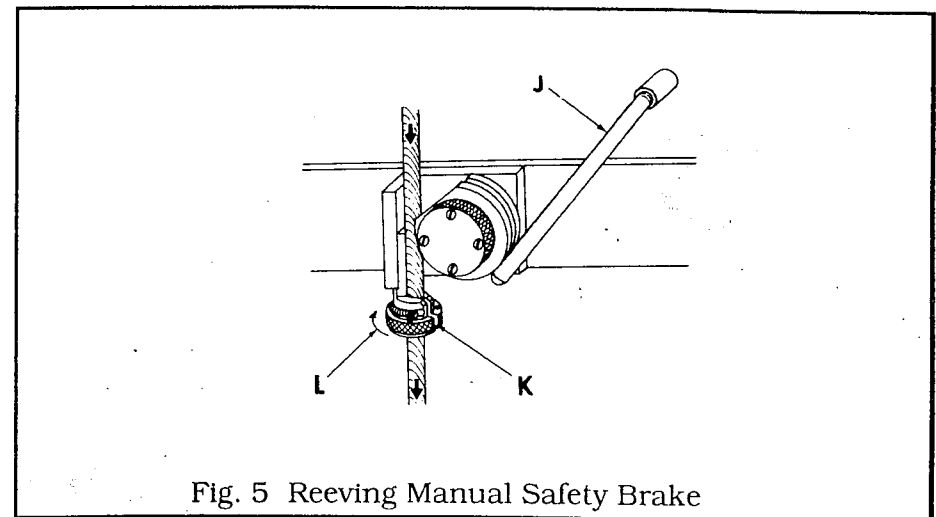
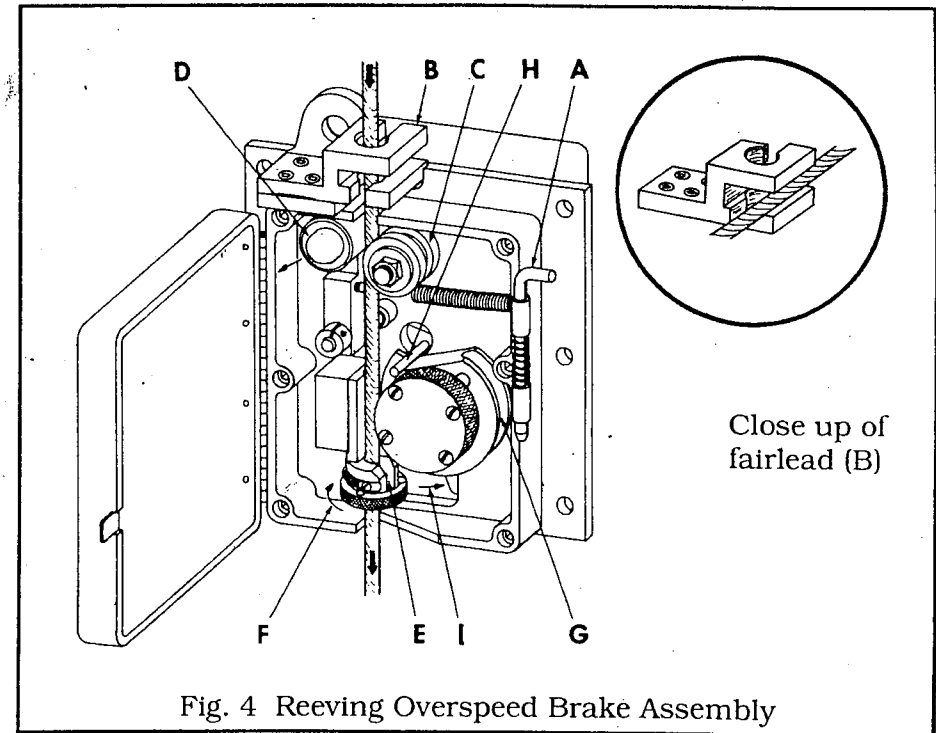
[See Fig. 4.]

- a. Insert wire rope in fairlead (B).
- b. With your thumb hold open spring-loaded roller (D), insert wire rope into groove in pressure wheel (C), then release.
- c. Open fairlead (E) by turning knurled ring (F) clockwise, insert wire rope, then release. Be sure to lock cover with lock pin (A).
- d. Test overspeed brake assembly by jerking wire rope upwards through the brake assembly. Eccentric cam (G) should automatically lock onto wire rope.
- e. Reset eccentric cam by pulling down on wire rope and turning it counterclockwise—push down latch pin (H) to engage cam.
- f. To trip eccentric cam manually push lever (I). Upon assurance that the trip release functions OK, reset eccentric cam per step "e".

### 2. Reeving Manual Safety Brake

[Fig. 5.]

- a. Raise manual safety brake handle (J).
- b. Open fairlead (K) by turning knurled ring (L) clockwise, insert wire rope, then release.



## 4.0 REEVING

# HI-LO CLIMBERS

**NOTE:** Set the manual safety brake to keep the stirrup frame from falling while reeving the speed reducer.

### 3. Reeving Speed Reducer

[See Fig. 6 and 7.]

- a. Open cover (A).
- b. Push with your hand against transfer wheel (M) to swing breech open.
- c. Insert wire rope between drive pulley (N) and transfer wheel (M).
- d. Wind wire rope around drive pulley (N) clockwise—pull up spring-loaded pawl (O) to permit wire rope to continue around drive pulley (N). To release pawl from clutch teeth rotate drive shaft counterclockwise.
- e. Continue reeving wire rope over and around transfer wheel (M)—then up, over and around tension sheave (Q)—then down through fairlead (R).
- f. After opening knurled ring, insert wire rope in bottom fairlead ring (R). Swing breech open to withdraw confinement pin (T), insert wire rope in bottom fairlead ring and then pull down on wire rope to remove slack. [Fig. 6.]
- g. To remove wire rope from speed reducer—power unit downwards slightly and pull slack in wire rope above speed reducer.
- h. To release pawl from clutch teeth rotate drive shaft counterclockwise.

**WARNING:** Failure to secure the wire rope in the bottom fairlead (R) may result in the wire rope becoming disengaged from the speed reducer resulting in potential danger to the user.

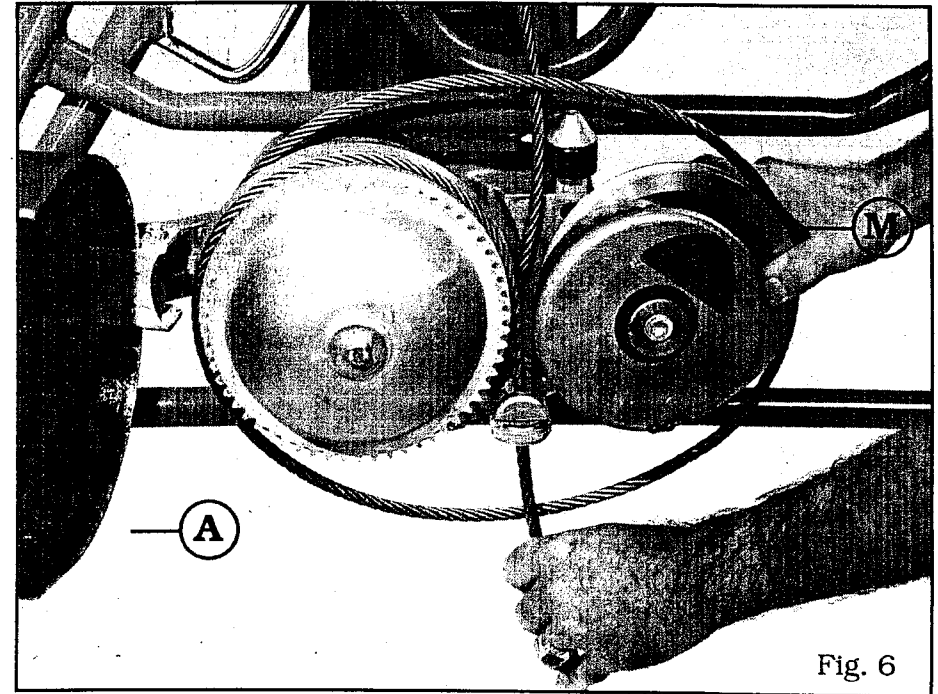


Fig. 6

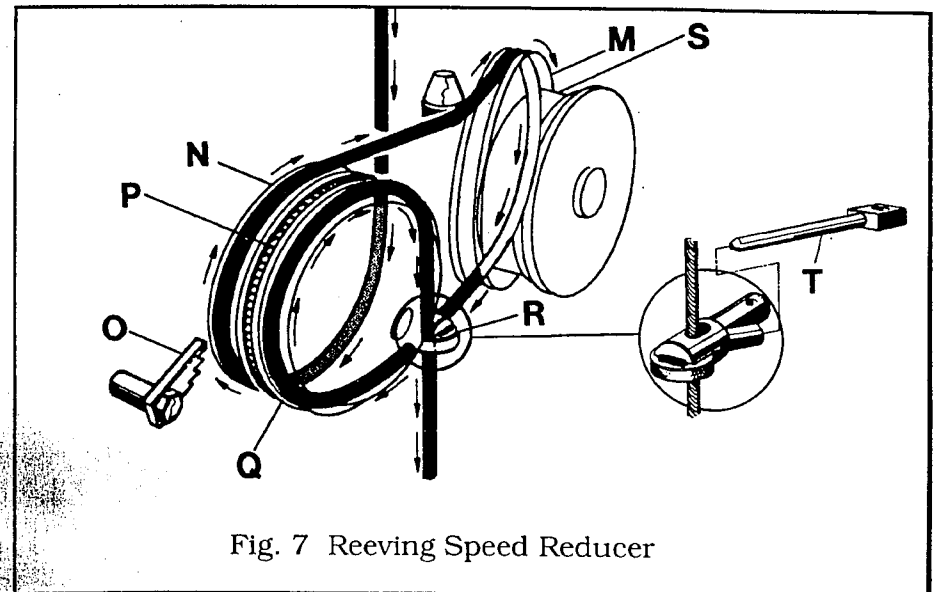


Fig. 7 Reeving Speed Reducer



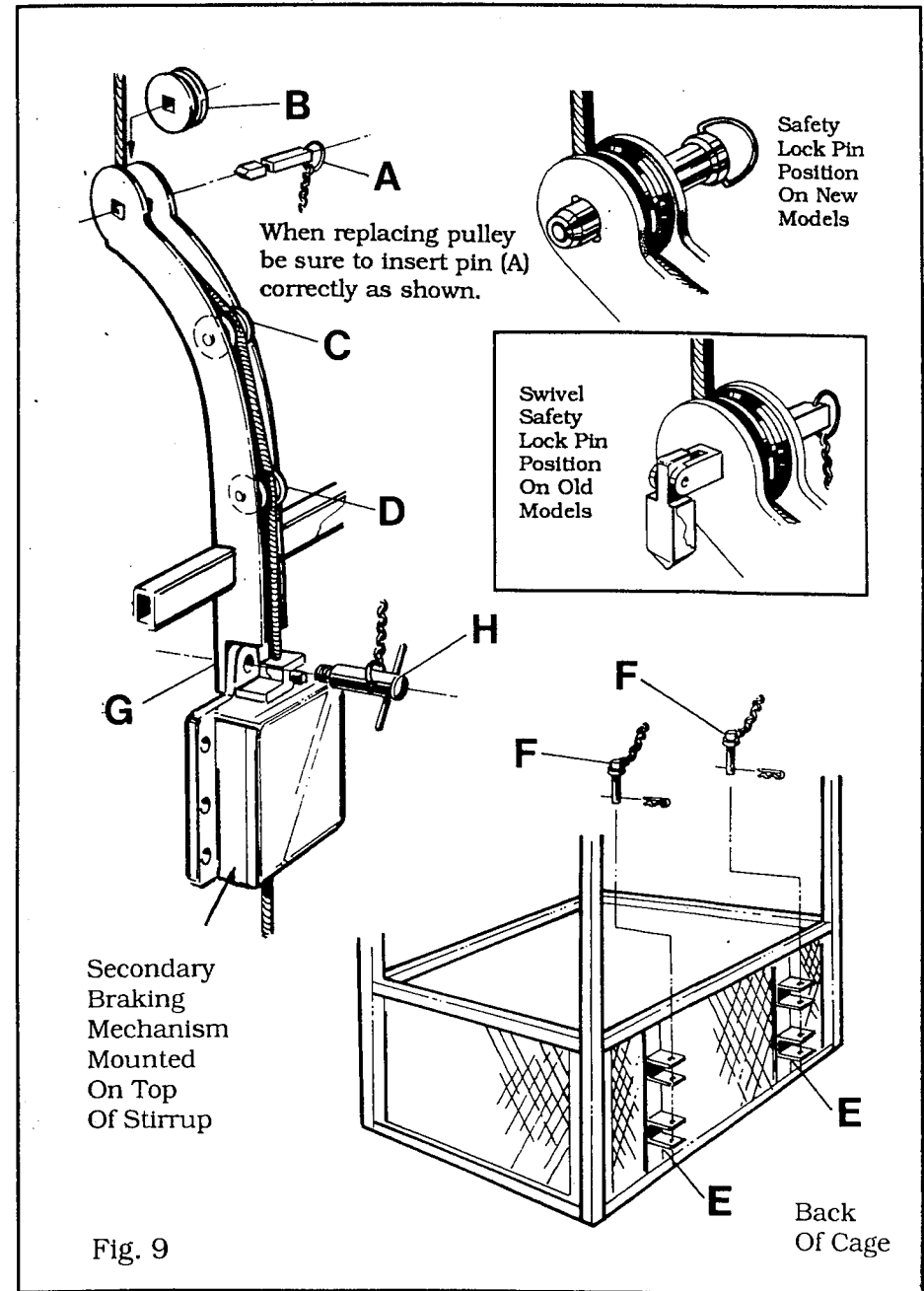
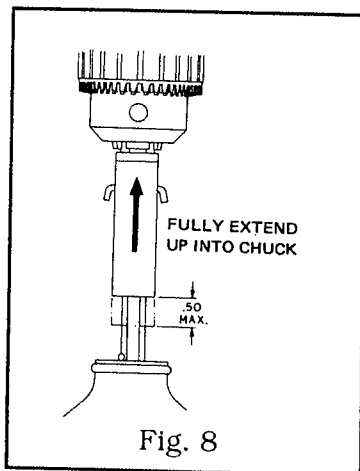
## 4.0 REEVING

# HI-LO CLIMBERS

### 4. Reeving & Assembling Work Cage

[See Fig. 9.]

- a. Remove lock pin (A).
- b. Lift pulley (B) to insert wire rope underneath.
- c. Replace pulley and lock pin. On old models with square lock pin, make sure the swivel lock pin hangs down.
- d. Insert wire rope over pulleys (C) and (D).
- e. Attach stirrup frame to work cage by inserting lock pin (F) in brackets (E).
- f. Install "T" clamp (H) through top of frame, then thread into lug (G) on cage boom.
- g. Mounting motor—be sure motor handle clamp [See Fig. 14] and motor chuck are securely tightened. Fully extend shear pin shaft up into motor chuck before tightening. [See Fig. 8.]



# HI-LO CLIMBERS

## 5.0 PRE-OPERATION PROCEDURES

### 1. Inspection & Preparation of Unit

The operator and user of this equipment must make the following tests and inspections prior to each day's operation and repeat them each time the scaffold or supports are relocated.

The following tests assume that the Hi-Lo unit has been reeved for operation.

- a. **Overspeed Brake Assembly Test**—Create slack in the wire rope between the manual safety brake and the overspeed brake assembly. Grab the wire rope just above the overspeed brake assembly and sharply pull up on it. Within a few inches the brake should lock onto the wire rope.
- b. **Manual Safety Brake Test**—Release the brake handle allowing the brake to engage the wire rope. Power the unit down. The brake should support the entire load.
- c. **Pawl Test**—Pull and release the spring-loaded pawl (Item O—Fig. 7) to make sure it snaps back into place freely. The pawl should engage the clutch plate teeth when powering the unit down and prevent the clutch plate from rotating.
- d. **Visual Inspection**—Raise and lower the unit three to four feet with its intended load. Be sure the wire rope is seated in the right grooves (Fig. 7) and secured behind the confinement pin (Fig. 7, Item T) inside the bottom fairlead (Fig. 7, Item R).
- e. **Check List**—Refer to the safety check list (Section 2.0). Make sure you have covered all points.

**WARNING:** The operator must check his rigging, platform, wire rope and Hi-Lo units daily to make certain they are in safe working condition.

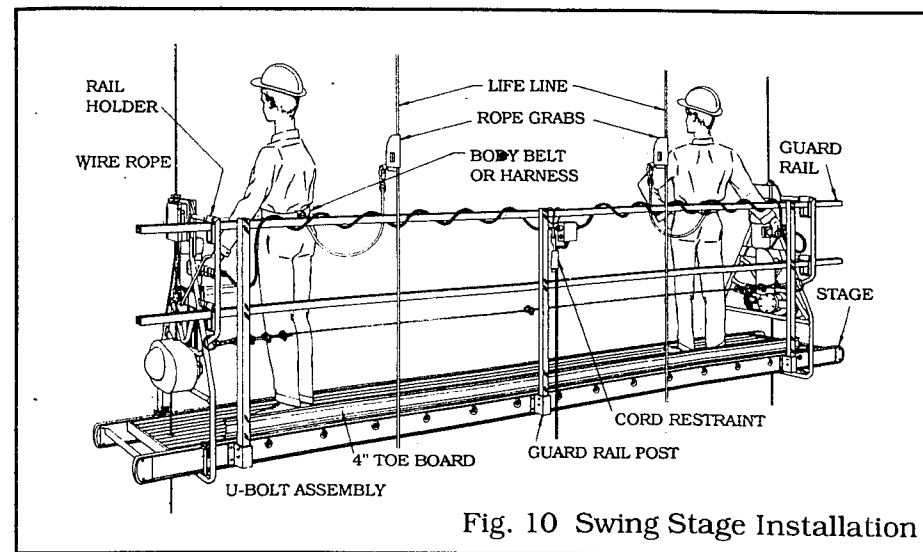


Fig. 10 Swing Stage Installation

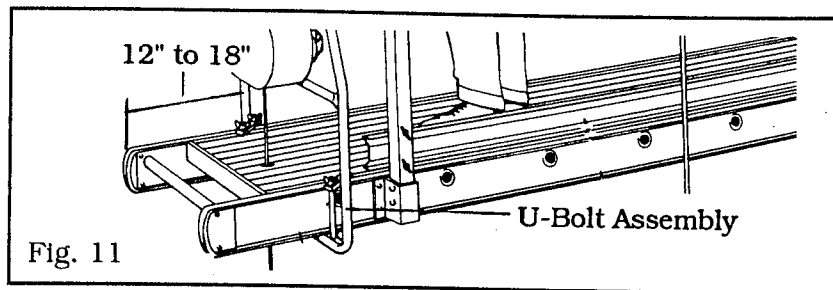
### 2. Proper Assembly & Installation of Swing Stage with Hi-Lo Units

- a. When moving or transporting an assembled stage, fold down the stirrup frame (fold down frames only) onto the stage to prevent possible damage from overturning.
- b. Always reeve Hi-Lo units from the top down as outlined in Section 4.0 Reeving. Lock the manual safety brake by pushing the brake handle down to prevent the stirrup frame from falling over while reeving the speed reducer.
- c. Staging and scaffolds used must conform to all current code requirements (See Fig. 10.)
- d. Never load staging platform in excess of nameplate rating.
- e. Scaffolds used with D-800, FD-24 and FD-18 frames must have an overall width of not less than 20 inches or more than 28 inches.
- f. Position stirrup frames on stage so that the motor operation handle is on inside of stage. Note an odd stirrup serial number indicates left hand unit. An even stirrup serial number indicates a right hand unit.

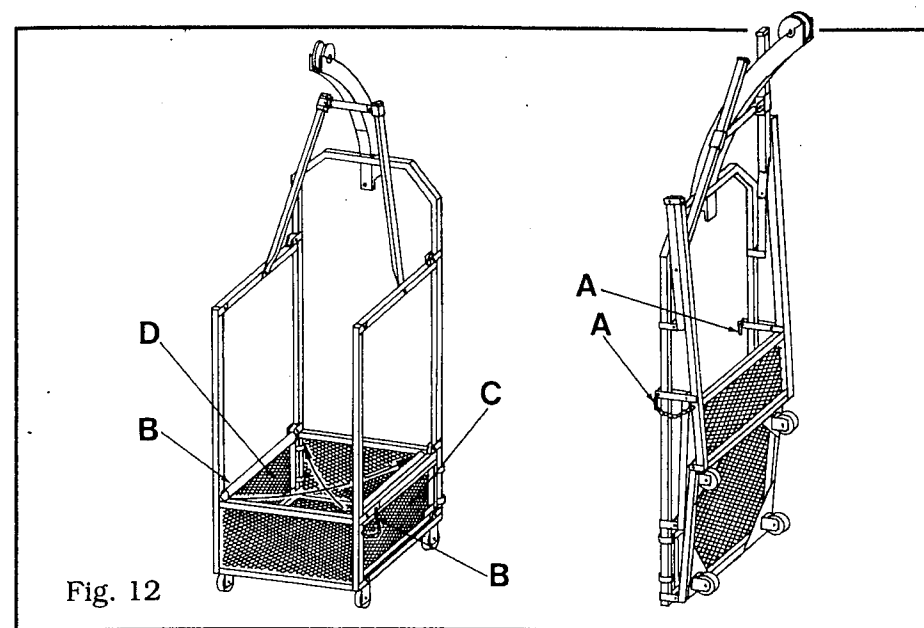
# HI-LO CLIMBERS

## 5.0 PRE-OPERATION PROCEDURES

- g. Stirrup frame must be positioned not less than 12 inches or more than 18 inches from end of platform and be securely fastened in place with "U" bolts or clamps provided with unit. [See Fig. 11.]



- h. Electric cords must be secured with cord restraints.
- i. Wire rope must be hung straight or vertical from the roof supports to the stirrup, and tail of wire rope must be dropped straight through stage.
- j. Secure all tools, materials and other equipment to the stage to prevent their overturning or falling.
- k. Toeboards, guard rails, guard rail supports and intermediate rails must be properly installed. Current code requirements must be complied with.
- l. Life lines must be in conformance with OSHA requirements and certified to a minimum breaking strength of 5,400 lbs. Life lines must be tied off to an attachment point separate from the wire rope supporting the hoist. [See Fig. 10.]
- m. Approved fall-arrest equipment securely attached to life lines must be worn by workmen at all times.
- n. Protect building surface from abrasion by the staging with building face rollers (Wall Bumpers—Part No. 260-020, 260-022).
- o. Follow all federal, state and local codes, ordinances and regulations pertaining to the use and safety of suspended platforms and associated equipment.



### 3. Proper Assembly of Fold-Down Work Cage

- a. To fold or unfold the work cage, it must be laid down with the casters facing up.
- b. Remove lock pins or nuts and bolts from lock pin brackets (Item A, Fig. 12).
- c. Unfold cage.
- d. Align holes in lock pin bracket with holes in cross member (Fig. 12, Item B) and replace nuts and bolts or lock pins, with swivel lock pin hanging down vertically.
- e. Swing out wire mesh sides (Fig. 12, Items C & D).
- f. To Fold Cage—reverse the above procedure. Be sure to fold in wire mesh side C first, then side D.

**WARNING:** The folding work cage with the stirrup frame attached will be slightly rear heavy. Never move work cage from rear, always stand in front of cage and pull to move.

## 5.0 PRE-OPERATION PROCEDURES **HI-LO CLIMBERS**

### 4. Operator's Responsibilities

The operator is responsible for the following:

- Inspect the Hi-Lo unit at the start of each working day.
- Inspect the rigging at the start of each working day.
- Know, understand and follow all federal, state and local government regulations concerning safe operation of powered hoists.
- Has read and understands fully the Hi-Lo operator's manual and operates the equipment in accordance with its guidelines.

### 5. Operating Hi-Lo Climber Unit

Be sure you have read and understood Section 2.0 Safety.

#### a. To Raise Unit:

- Rotate directional control ring on motor to "UP" position. Ring has three positions: "UP," "NEUTRAL" and "DOWN."

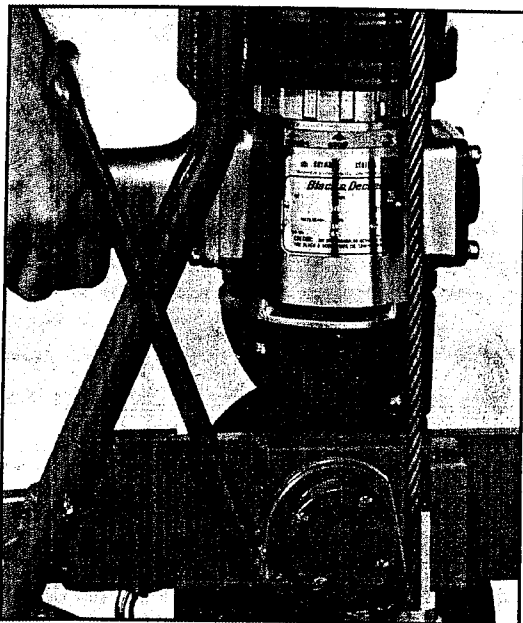


Fig. 13

- Raise manual safety brake lever and with same hand depress and hold trigger switch on motor for power. Brake lever should rest on operator's wrist while powering "UP" or "DOWN" as shown in Fig 13.

#### b. To Lower Unit:

- Rotate directional control ring on motor to "DOWN" position.
- Do not apply force to the manual safety brake lever. Power unit "UP" slightly to release brake.

### c. Emergency Manual Operation

- Should a power failure take place, unplug electrical cable.
- Release the motor handle clamp (1) [See Fig. 14] and loosen drill chuck (2) to remove motor.
- Insert speed wrench (3) provided with the unit into the hex shaft (4). Lower unit by turning speed wrench clockwise.

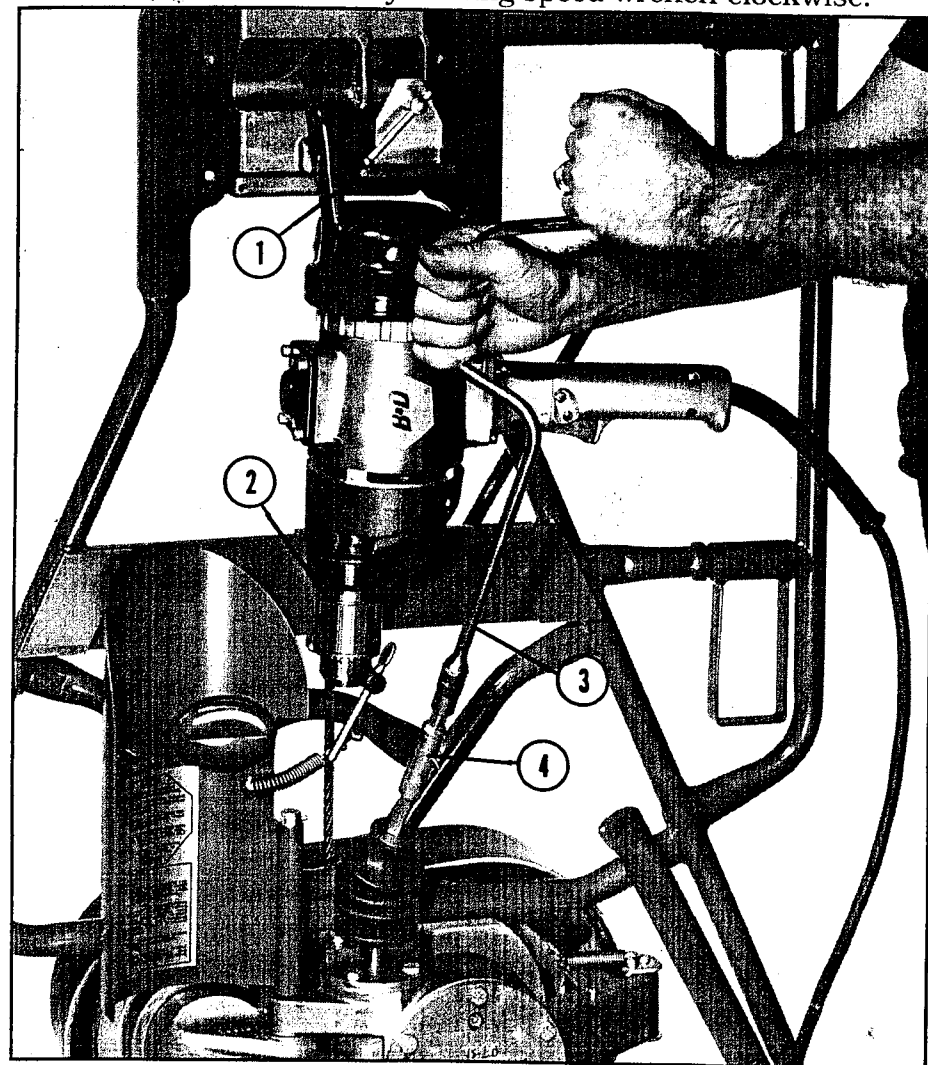


Fig. 14

## 6.0 WIRE ROPE

# HI-LO CLIMBERS

### 1. Wire Rope Care

**WARNING:** Do not use undersize or oversize wire rope. Wire rope must be inspected each day before use to make certain it is in safe working condition. Use fist grip wire rope clips only—do not use "U" type wire rope clips.

- Wire rope used with this equipment must conform to the following specifications: 5/16 inch diameter, 6 x 31 right regular lay; fiber core; extra improved plow steel; breaking strength 9,000 lbs.
- Wire rope is susceptible to serious damage if not handled in accordance with the manufacturer's instructions. Exposure to acids, corrosion, fire, electricity and undue heat, or mistreatment will damage the wire rope. When such damage has occurred, replace wire rope immediately.
- Wire rope clips and fastenings must be retightened periodically to 30 ft-lbs—the wire rope will stretch and its diameter decrease with usage, causing the clips to loosen.
- Wire rope must be replaced if badly kinked or birdcaged, or if it shows broken strands or excessive wear (visible abrasion).
- Wire rope must be protected from sharp or abrasive edges of building protrusions or surfaces.

### 2. Inspection/Replacement Criteria

The full length of wire rope to be used shall be inspected. No precise rules can be given for determination of the exact time for replacement of wire rope since many variable factors are involved. Continued use of a wire rope depends upon the remaining strength and its ability to pass around the traction drum. Because of the nature of the application, wire rope SHALL be taken out of service when ANY of the following conditions exist:

- Four randomly distributed broken wires in three lays or two broken wires in one strand in three lays.
- More than one valley break (broken wire). A wire break in the valleys between strands indicates an abnormal condition, possibly fatigue and breakage of other wires not visible.
- Kinking, crushing, birdcaging, or any other damage resulting in distortion of the rope structure.
- Evidence of any heat damage from any cause.
- Evidence of rope deterioration from corrosion.
- Noticeable rusting, corrosion, pitting, or more than two broken wires in the vicinity of end attachments.
- Evidence of core failure (a lengthening of rope lay and a reduction in rope diameter suggests core failure).
- Reduction of wire rope diameter to 0.290", when measured under load.

**WARNING:** Replacement rope shall be to the hoist manufacturer's specifications.



Fig. 15 Proper method of uncoiling wire rope for inspection.

# HI-LO CLIMBERS

## 6.0 WIRE ROPE

### 3. Use Only Fist Grip Wire Rope Clips

Use only 5/16", fist grip wire rope clips [See Fig. 16.] with minimum of three clamps spaced approximately three inches apart.

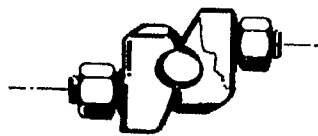
DO NOT USE "U" type clips [See Fig. 16.] These crush wires and reduce wire rope strength. Always use a 5/16" heavy duty thimble and a 5/8" screw pin shackle to avoid permanent damage and to retain full wire rope strength for use on future jobs. Insulated thimbles are available for rigging platforms which are to be used for welding. Braze both ends of wire rope.

When installing fist grips tighten each to 30 ft-lb, then apply 1000 pounds hanging proof load; while applying proof load, retorque clips to 30 ft-lb.

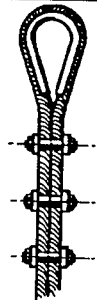
**WARNING:** Always check rigging and fist grips daily for tightness (30 ft-lb) before platform is used.



Never use  
"U" type  
clips



Always  
use fist  
grip wire  
rope clips



Space fist grip  
wire rope clips  
about 3" apart

Fig. 16

## 7.0 TROUBLESHOOTING

The following section identifies problems that might arise during operation and offers possible solutions. If a problem arises that is not covered in this section, remove the unit from service and return it to your local Hi-Lo representative. Never attempt to perform maintenance while unit is suspended.

### 1. Electric Motor Will Not Operate

- Check directional control ring on motor to assure it is completely in "UP" or "DOWN" position.
- Check plugs, cords and power source including circuit breakers. If problem cannot be located, take the motor to your local service dealer.
- Unplug motor and check motor brushes; if less than 3/8" long—replace.

### 2. Air Motor Will Not Operate

Motor will not start or no power:

- No air or too little—check with pressure gauge at unit while running under load. Should be 90 p.s.i. at 55 c.f.m.
- Fittings and/or air supply line too small. Use 3/4" line minimum and proper fittings.
- Plugged filter—clean.
- Air motor frozen: Open petcock at bottom of lubricator and drain oil or water. Close petcock and open lubricator cap. Pour approximately 4 ounces of kerosene into lubricator and replace cap. Connect air supply. Actuate motor and after motor is free and running, drain any remaining kerosene from lubricator and replace with No. 10 NON-DETERGENT oil.

**3. Unit Fails to Operate Smoothly or Shows Hesitation While Lifting**

- a. Check wire rope reeving.
- b. Check drive pulley for excessive wear. If there is any visible rounding of flat sides of groove—replace pulley.
- c. Check tension sheave for wear. If wire rope bottoms in groove—replace it.
- d. Check pressure wheel for excessive wear.
- e. Motor brushes may be worn out. If brushes are less than 3/8" long—replace them.
- f. Check screws under plastic trigger switch on motor for tightness.

**4. Unit Fails to Operate Smoothly or Shows Hesitation While Lowering**

- a. Check to make sure the pawl is engaging the clutch plate teeth. [See Fig. 17.]
- b. Check clutch plate; if glazed—clutch must be cleaned with sandpaper. If impregnated with oil—clutch must be replaced. Never attempt to perform this maintenance while unit is suspended.

**5. Unit Fails to Lift**

Check shear pin; if broken, replace with shear pins provided in coin purse. [See Fig. 18.]

**6. Unit Fails to Lower**

Check overspeed brake assembly; if in locked position—power unit "UP" slightly and reset. (See 4.0 Reeving—Overspeed Brake Assembly).

**7. Unit Squeaks or Chatters As It Comes to a Stop While Descending**

Check clutch plate; [Fig. 17] if glazed—clutch must be cleaned with sandpaper. If impregnated with oil—clutch must be replaced. Never attempt to perform this maintenance while unit is suspended.

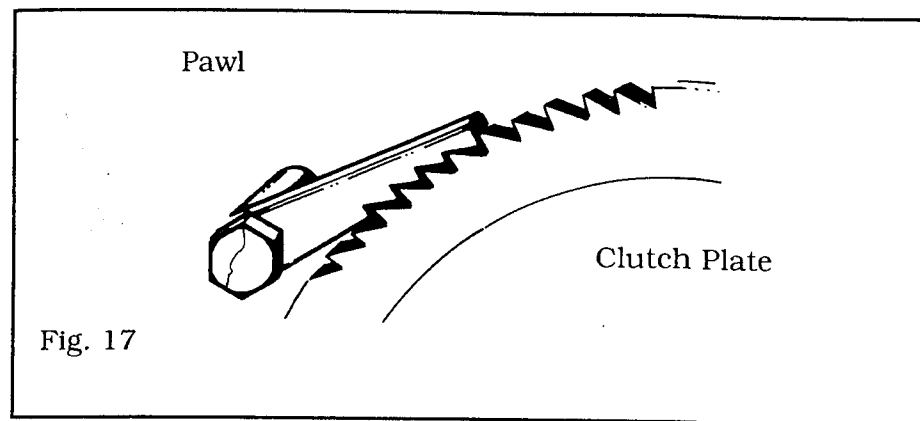


Fig. 17

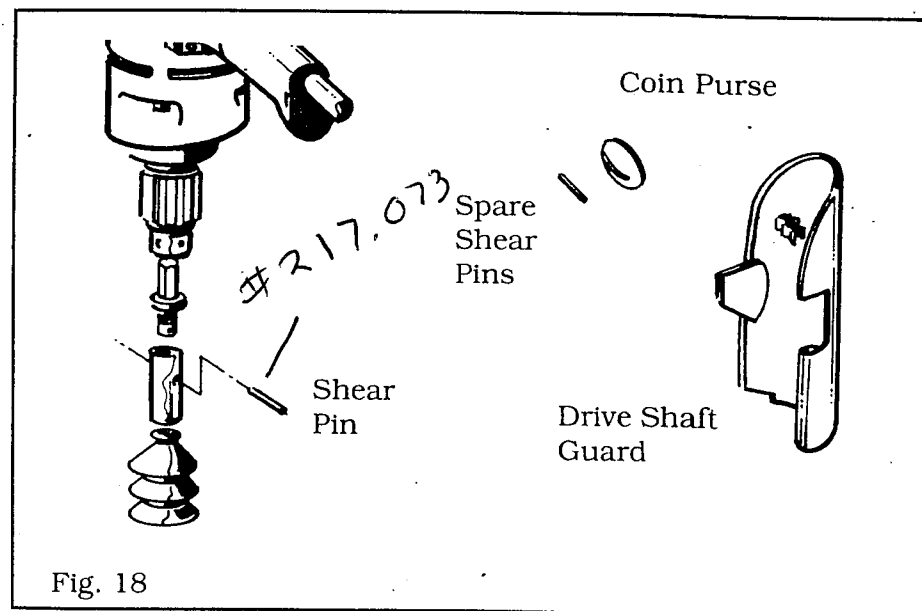


Fig. 18

# HI-LO CLIMBERS

## 8.0 MAINTENANCE

Never attempt maintenance, repair, or replacement of parts while the unit is suspended.

Regular maintenance and servicing is required for proper equipment operation and safety. The following maintenance procedures will assure long and trouble free service.

Maintenance must be performed by a factory authorized service representative or other qualified mechanic.

### 1. Lubrication

The Hi-Lo requires no lubrication except to maintain the oil level in the speed reducer housing and one grease fitting located on the universal-joint assembly.

**ONCE A MONTH** check the oil level in the speed reducer housing and use one shot of grease in the grease fitting on the universal joint assembly.

**ONCE A YEAR** the oil in the speed reducer housing must be drained and replaced with 1-1/2 pt. of new SYNTHETIC GEAR OIL (Part No. 215-196).

- a. Remove housing cap.
- b. Empty oil from housing.
- c. Flush and clean inside of housing with kerosene.
- d. Replace oil.
- e. Replace housing cap.

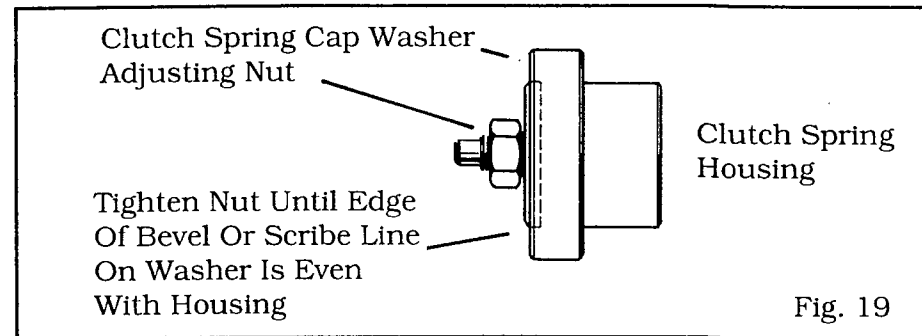
### 2. Service

All moving parts are subject to wear and must be inspected at least MONTHLY for excessive wear and damage and to assure they are free of contamination and function freely. Special attention should be paid to the following parts:

- a. Drive Pulley—If wear on inside of pulley shows any visible rounding of flat sides of groove—replace.
- b. Tension Sheave—If wire rope bottoms in groove—replace.
- c. Pressure Wheel—If groove wear exceeds 3/32" depth—replace.
- d. Drill Motor Brushes—If brushes are less than 3/8" long—replace.
- e. Check screws under plastic drill handle cover for tightness.

### 3. Adjustments

The only adjustment on the Hi-Lo is to assure that the clutch spring washer is adjusted as illustrated. [See Fig. 19.]



### 4. Parts Replacement

Never alter, remove or substitute any part of this equipment. Only Hi-Lo supplied replacement parts and components may be used. Only experienced and qualified persons should attempt parts replacement.



# HI-LO CLIMBERS

## 9.0 RIGGING

**WARNING:** All roof hooks, parapet clamps, outriggers and anchoring devices must be tied back at right angles to the face of the building and tautly secured to a structurally sound portion of the building.

1. All rigging must be done under the supervision of a competent person experienced in rigging and in compliance with all federal, state and local codes, ordinances and regulations.
2. Parapet and roof conditions must be inspected for structural integrity by a competent and experienced person.
3. All anchoring devices and methods must provide for support of at least 4 times the rated lifting capacity of the hoist.
4. Connection of wire rope to the outrigger or other rigging must be made with proper fittings designed for the purpose. Never wrap wire ropes around overhead rigging or use makeshift devices.
5. Overhead attachment points must be maintained at the same distance apart as the hoisting machines.
6. All overhead rigging, counterweights, anchorages and connections must be secured and adequately prevented from movement in any direction.
7. Always secure platform to the building face when at work station.
8. Do not rig platform near high tension or uninsulated electrical power wiring.
9. Rig wire rope with adequate length to permit reeving the hoist and allow at least 6 feet excess on the ground.

10. Tie backs must be used to secure each outrigger or other anchoring device to a structurally sound member of the building. Tie backs must be made of at least 5/16" wire rope, 9,000 lb. breaking strength with three fist grip type clips on each end.

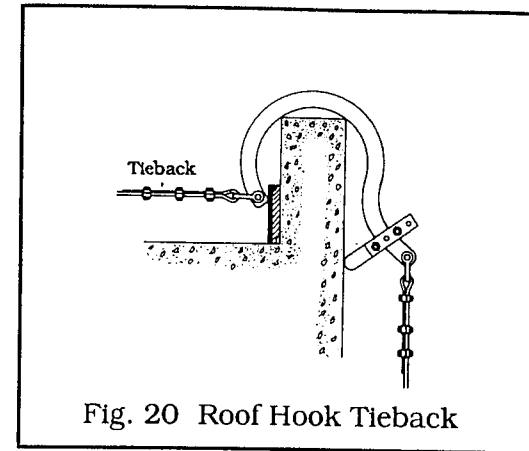


Fig. 20 Roof Hook Tieback

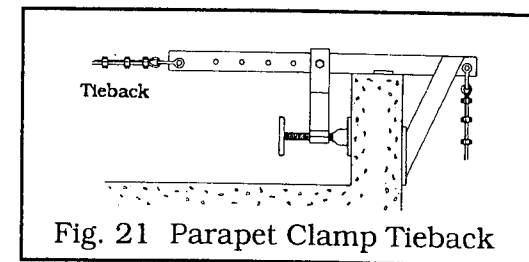


Fig. 21 Parapet Clamp Tieback

**Parapet Clamps**—[Fig. 21] If parapet clamps are used for anchoring, the parapet wall must absorb the total system's weight and therefore must be inspected for structural strength at a 4 to 1 safety factor.

9.0 RIGGING

# HI-LO CLIMBERS

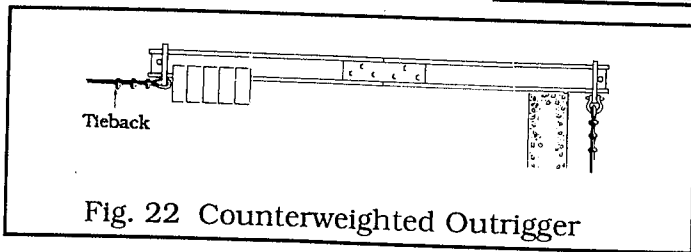


Fig. 22 Counterweighted Outrigger

**Counterweighted Outrigger**—[Fig. 22] Outriggers must be horizontal or pitched slightly to the rear. Never pitch toward the end which supports the stage. Structurally sound bearing blocks of sufficient size must be used to distribute loads imposed on roof.

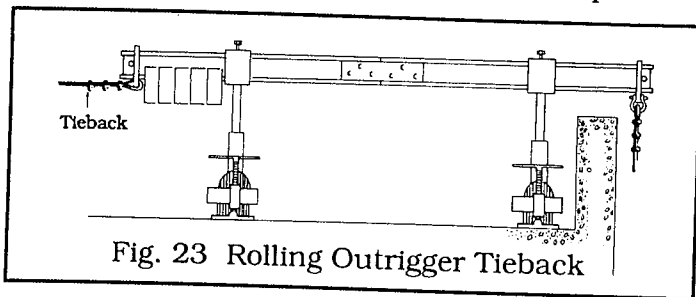


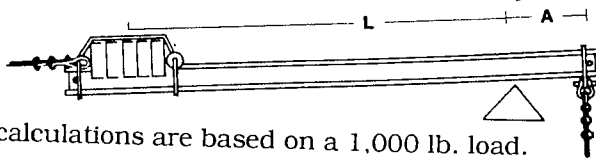
Fig. 23 Rolling Outrigger Tieback

**Rolling Outrigger**—[Fig. 23] Rolling outriggers may only be used on flat roof, and must be secured from movement in any direction.

**Counterweight Chart**

A is overhang of 2 feet maximum.

These calculations are based on a 1,000 lb. load.



L (ft.)	14	12	10	8	6	4
Counter Weight (lbs.)	575	670	800	1000	1335	2000

**WARNING:** Counterweights must be made of a non-flowable material (no sandbags) and be securely attached to the rear of the outrigger.

10.0 Code of Safe Practices

Give to Scaffold Erector & User or Post on Job

## Code of Safe Practices for Suspended Powered Scaffolds

It shall be the responsibility of all employers and users to read and comply with the following common sense guidelines which are designed to promote safety in the erection and use of suspended powered scaffolds. These guidelines are not all-inclusive, nor do they supplant or replace other additional safety and precautionary measures to cover usual or unusual conditions. If these guidelines conflict in any way with any state, local or federal statute or governmental regulation, said statute or regulation shall supersede these guidelines and it shall be the responsibility of each employer and user to comply therewith and also to be knowledgeable and understand all state, local or federal statutes or governmental regulations pertaining to suspended powered scaffolding.

I. GENERAL GUIDELINES

- A. Post these safety guidelines in a conspicuous place and be sure that all persons who erect, use, locate, or dismantle suspended scaffold systems are fully aware of them.
- B. NEVER TAKE CHANCES! If in doubt regarding safety or use of suspended scaffolds, consult your scaffold supplier.
- C. FOLLOW ALL EQUIPMENT MANUFACTURERS' RECOMMENDATIONS as well as all state, local and federal codes, ordinances and regulations, pertaining to suspended scaffolding.

## **HI-LO CLIMBERS**

### 10.0 CODE OF SAFE PRACTICES

- D. Survey the job site for hazards such as exposed electrical wires, obstructions that could overload or tip the suspended scaffold when it is raised or lowered, unguarded roof edges or openings, inadequate or missing tieback anchorages or the need for overhead protection where exposure to falling objects exists. These conditions must be corrected before installing or using suspended scaffold systems.
- E. **INSPECT ALL EQUIPMENT BEFORE EACH USE.** Never use any equipment that is damaged or defective in any way. Tag damaged or defective equipment and remove it from the job site.
- F. **ALWAYS USE FALL ARREST EQUIPMENT** when using suspended scaffolds. (See Section V for further details.)
- G. Erect, use and dismantle suspended powered scaffold equipment in accordance with design and/or manufacturer's recommendations.
- H. Do not erect, dismantle or alter suspended powered scaffold systems unless under the supervision of a qualified person.
- I. **DO NOT ABUSE, MISUSE, OR USE SUSPENDED SCAFFOLD EQUIPMENT** for purposes or in ways for which it was not intended.
- J. **USERS MUST BE TRAINED** on how to safely operate equipment and how to handle emergency situations. If in doubt, consult a qualified person.
- K. **ERECTED SUSPENDED SCAFFOLDS SHOULD BE CONTINUOUSLY INSPECTED** by the user to ensure that they are maintained in a safe condition. Report any unsafe condition to your supervisor.
- L. **CARE MUST BE TAKEN WHEN OPERATING AND STORING EQUIPMENT DURING WINDY CONDITIONS.**
- M. **POWERED PLATFORMS MUST NEVER BE OPERATED NEAR LIVE POWER LINES** unless proper precautions are taken. Consult the power service company for advice.

- N. **DO NOT WORK ON SCAFFOLDS** if you feel dizzy, unsteady in any way, or are impaired in any way by drugs or any other substance.

### II. RIGGING GUIDELINES

- A. **WHEN RIGGING ON EXPOSED ROOFS OR FLOORS, WEAR FALL PREVENTION EQUIPMENT.** WHEN RIGGING FROM OVERHEAD SUPPORTS, SUCH AS BRIDGES, BEAMS, ETC., WEAR FALL ARREST EQUIPMENT.
- B. Roof hooks, parapet clamps, outrigger beams, or other supporting devices, including tiebacks and their anchorages, must be capable of supporting the rated load of the hoist with a safety factor of 4.
- C. Verify that the building or structure will support the suspended loads with a safety factor of at least 4.
- D. Overhead rigging, including counterweights, must be secured from unintentional movement in any direction.
- E. Counterweights used with outrigger beams must be of a nonflowable material and fastened to the beam.
- F. Outrigger beams that do not use counterweights must be installed and secured on the roof structure with devices specifically designed for that purpose.
- G. Tie back all transportable rigging devices with wire rope and hardware that has strength equal to the hoist rope.
- H. Install tiebacks at right angles to the face of the building and secure without slack to a structurally sound portion of the structure, capable of supporting the hoisting machine rated load with a safety factor of 4. In the event tiebacks cannot be installed at right angles, use two tiebacks at opposing angles to prevent movement.
- I. **RIG SO THAT SUSPENSION POINTS ARE DIRECTLY ABOVE THE HOISTING MACHINES.**

# **HI-LO CLIMBERS**

## **10.0 CODE OF SAFE PRACTICES**

- J. The platform must be secured to prevent swaying. Do not tie it to window cleaning anchors.

## **III. WIRE ROPE AND HARDWARE GUIDELINES**

- A. Use only wire rope and attachments as specified by the hoisting machine manufacturer. Do not use wire rope that is kinked, birdcaged, corroded, undersized, or damaged in any way.
- B. Be sure that wire rope is long enough to reach to the lowest possible landing.
- C. Clean, lubricate and handle wire rope in accordance with the wire rope or hoist manufacturer's instructions.
- D. Coil and uncoil wire rope in accordance with the wire rope or hoist manufacturer's instructions in order to avoid kinks and damage.
- E. Use thimbles at all wire rope suspension terminations.
- F. Use J-Type clamps or swaged fittings to fasten wire rope. **DO NOT USE U-CLAMPS.**
- G. Tighten wire rope clamps in accordance with the clamp manufacturer's instructions.
- H. Wire ropes used with traction hoists must have prepared ends in accordance with the manufacturer's recommendation.
- I. **INSPECT WIRE ROPE DURING EACH ASCENT AND DESCENT.** Do not expose wire rope to fire, undue heat, corrosive atmosphere, chemicals, or to passage of electrical currents or to damage by tools or handling.

## **IV. POWER SUPPLY GUIDELINES**

- A. **BE SURE YOUR POWER SUPPLY CONFORMS TO HOIST MANUFACTURER'S RECOMMENDATIONS.**
- B. **GROUND ALL ELECTRICAL POWER SOURCES, POWER CORD CONNECTIONS** and protect with circuit breakers.

- C. Use power cords or air hoses of proper size that are long enough for the job.
- D. Power cord or air hose connections must be restrained to prevent their separation.
- E. Tie off power cords or air hoses to the suspended scaffold to prevent them from falling.
- F. Protect power cords or air hoses at sharp edges.
- G. Remember, air hoists require clean, lubricated air.

## **V. FALL ARREST EQUIPMENT GUIDELINES**

- A. Each person on a suspended powered scaffold must be attached to a fall arrest system at all times.
- B. Each lifeline must be fastened to a separate anchorage.
- C. When wrapping lifelines around structural members the lines must be protected and a suitable anchorage system must be used.
- D. Protect lifelines at sharp corners to prevent chafing.
- E. Rig fall arrest systems to prevent free fall in excess of six feet.
- F. Lifelines must be suspended freely without contact with structural members or building facade.
- G. Use a lifeline size and construction that is compatible with fall arrester and complies with applicable safety codes.
- H. **BE SURE FALL ARRESTER IS INSTALLED ON THE LIFELINE IN THE PROPER DIRECTION ABOVE YOUR HEAD** and in accordance with the manufacturer's recommendations.
- I. Use a body support device that is properly sized and fitted.
- J. Be sure body support device has a lanyard attached to the D-ring at the center of the back.

# HI-LO CLIMBERS

## 10.0 CODE OF SAFE PRACTICES

### VI. SOME ADDITIONAL GUIDELINES

- A. USE ALL EQUIPMENT AND ALL DEVICES IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- B. Do not overload, modify, or substitute equipment.
- C. Before commencing work operations pre-load wire rope and equipment with the maximum working load, then retighten rigging clamps to manufacturer's recommendations.
- D. Be sure platform and cages have a proper guardrail system.
- E. Secure stirrups no less than six inches from the end of the platform.
- F. All components must be securely fastened to prevent them from falling off the platform.
- G. Use roller bumpers or buffers to prevent damage to the structure or equipment.
- H. Use care to prevent damage to equipment by corrosive or other damaging substances.
- I. Clean and service equipment regularly.
- J. ALWAYS MAINTAIN AT LEAST FOUR (4) WRAPS OF WIRE ROPE ON DRUM TYPE HOISTS.
- K. Traction hoists must have wire rope that is long enough to reach from the highest point of support to the lowest possible landing, plus reeving lengths.
- L. Do not join platforms unless the installation was designed for that purpose.
- M. DO NOT MOVE SUSPENDED SCAFFOLDS HORIZONTALLY WHEN OCCUPIED.
- N. When re-rigging for another drop be sure sufficient wire rope is available before moving the suspended scaffold system horizontally.

- O. WHEN WELDING FROM SUSPENDED SCAFFOLDS:
  - 1. Be sure platform is grounded to structure.
  - 2. Insulate wire rope above and below the platform to protect from damage by the welding torch or electrode.
  - 3. Insulate wire rope at suspension point and be sure wire rope does not contact structure along its entire length.

These Safety Guidelines (Code of Safe Practices) set forth some common sense procedures for safely erecting, dismantling and using suspended scaffolding equipment. Since equipment and scaffolding systems differ, reference must always be made to the instructions and procedures of the supplier and/or manufacturer of the equipment. Since field conditions vary, and are beyond the control of the Scaffold Industry Association and the Scaffolding, Shoring & Forming Institute, safe and proper use of scaffolding is the sole responsibility of the employer and user.

Form No. 0108S  
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## HI-LO CLIMBERS

### NOTES

### GUARANTEE

**Lifetime:** All individual parts, except electrical and air components, which prove to our satisfaction to have been defective in materials or workmanship at the time of manufacture.

**Five Year:** Every Hi-Lo Climber has been carefully inspected and adjusted before shipment. We guarantee to replace, at no charge, any worn or defective parts of the gear housing, gears and parts contained therein (except for seals) for a period of FIVE years after delivery providing the proper oil level is maintained.

**One Year:** Hi-Lo further guarantees to replace, at no charge, any defective parts for a period of ONE year after delivery. Labor is not included.

All replaced parts must be available for return, upon request, to Hi-Lo Climbers (transportation charges prepaid) for inspection. If it should be necessary to return a complete unit to the factory for repair or for correction of a defect, transportation charges must be prepaid. Hi-Lo Climbers' obligations hereunder shall not include making any repairs, replacements, or mechanical adjustments resulting from accidents, misuse, alteration of the equipment or power fluctuations.

The foregoing guarantee is in lieu of all other guarantees, expressed or implied; and in no event shall we be liable for delay resulting from defects, for consequential damages, or for any charges or expenses of any nature incurred without our written consent.

This extended guarantee is only valid if this equipment has been operated, serviced and maintained in strict accordance with the Hi-Lo Climbers OPERATOR'S and MAINTENANCE MANUAL.