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H & H Specialties has manufactured equipment for entertainment and performing arts facilities for over 35 years under the Atlas Silk® trademark. During that time, users have come to expect their equipment to accommodate increased loads, operate smoother, perform more difficult tasks and last longer. H & H Specialties has continually worked with architects, consultants, and users in designing products to meet these demands.

The following pages illustrate our standard rigging products. Our products are sold by dealers throughout the United States, Canada and many other countries, providing local sources for the supply, installation and maintenance of the products shown. In addition to those products detailed, the factory's design and manufacturing capabilities are available to create custom modified equipment for special applications.

Our new catalog has many changes, including new product numbers and working load limits. In addition to the information contained herein, we offer product specifications, CAD drawings and other information in our companion *Toolkit* CD-ROM. Inquiries regarding any product, or custom equipment designed to your specifications, can be addressed to individual dealers or directly to the factory.

DISCLAIMER

The products in this catalog are designed for lifting stage curtains, scenery, lighting, and other equipment typical to performing arts facilities.

NONE OF THE ITEMS SHOWN HEREIN ARE INTENDED FOR THE USE OF LIFTING OR TRANSPORTING PEOPLE OR OTHER LIVING OBJECTS.

H & H Specialties Inc. makes no representation of the suitability of any product for any application unless specific engineering drawings are made by the factory and the products are installed in precisely the manner detailed by our engineering staff.

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- Counterweight Rigging
- Motorized Rigging
- Stage Curtain Tracks
- Curtain Machines
- Cubicle Tracks

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The demands of theatre are constantly changing. What was considered adequate for productions thirty years ago is now understated. Careful planning at the beginning can increase the usefulness of the space during its lifetime. A high school multi-use auditorium today may also serve a second function as a community theatre or town hall tomorrow.

A theatre is a complicated structure. In addition to the normal building systems, it

must also integrate many specialized equipment systems specific to the theatre. These specialized systems include stage rigging, draperies, stage lighting, audio, and communication. Care must be taken to carefully coordinate all of these systems in order to avoid conflicts. The proper selection and installation of counterweight rigging equipment will result in a system that is both functional and meets current safety requirements.

Counterweight Rigging Systems:

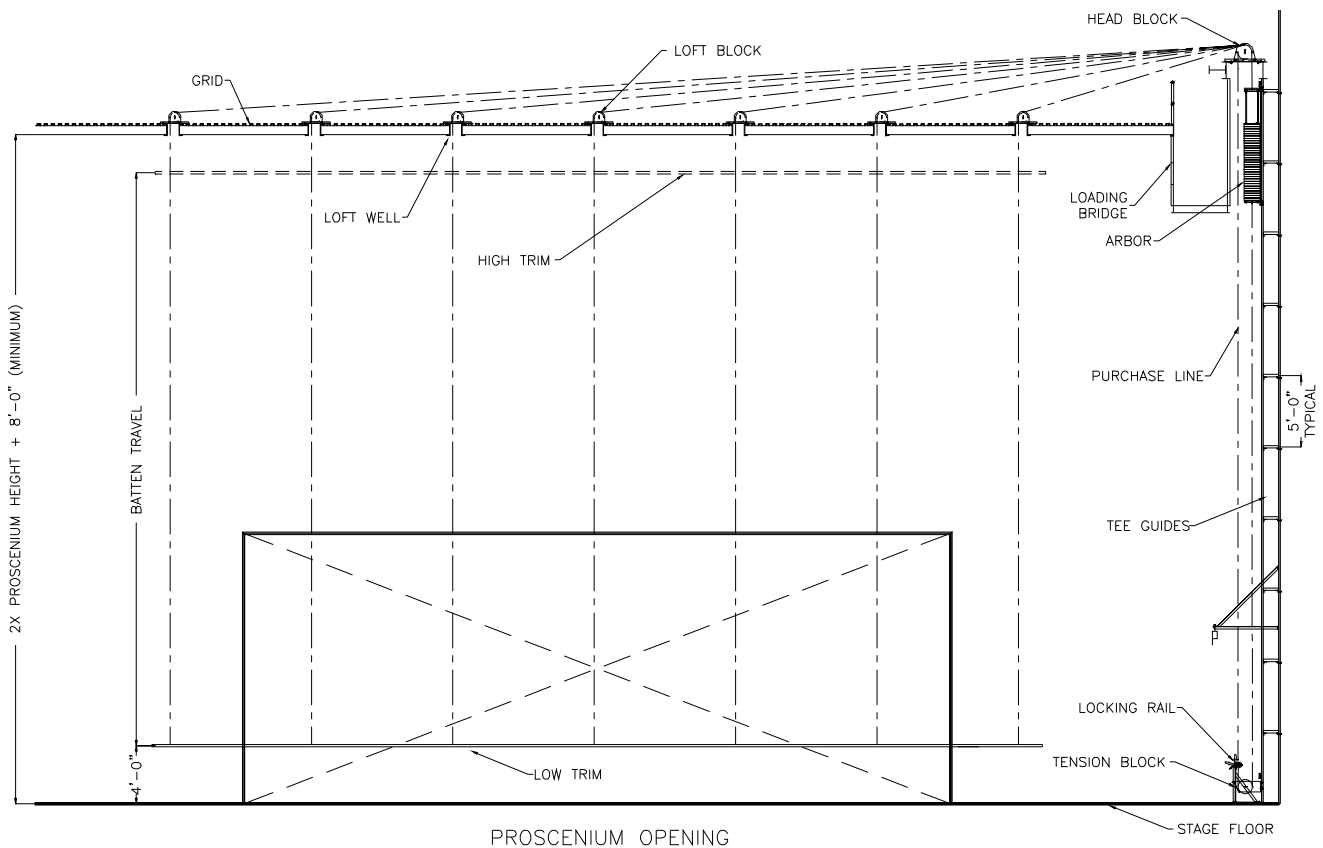
A theatrical counterweight system provides a simple method of raising and lowering various balanced loads by a system of pulleys and weight carriages. As the scenery and equipment loads are varied, the amount of counterbalance is adjusted on the weight carriage so that the system can be raised and lowered with a minimum amount of effort. A counterweight system is meant to be operated in a near balanced condition.

Rigging systems are composed of basic components. The major components include the following:

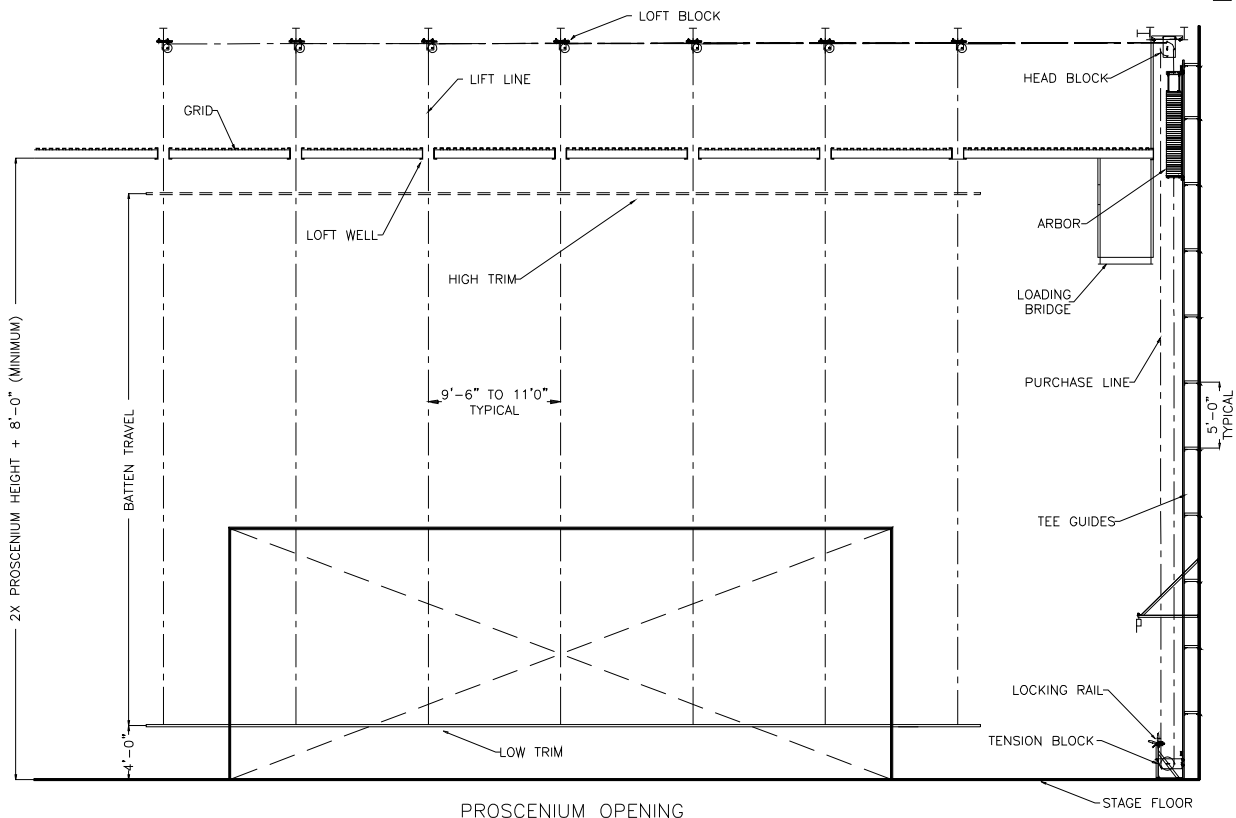
Pipe Batten: Typically a 1-1/2" standard pipe used for the attachment of draperies, scenery, lighting, and other items.

Lift Lines: 3/16" or 1/4", 7x19 galvanized aircraft cable used to support the batten at intervals approximately ten feet on center.

Loft Block: A single groove sheave assembly used in groups for the support of the pipe batten.



Typical Upright Counterweight System



Typical Underhung Counterweight System

Head Block: A multi-groove sheave assembly whose purpose is to gather all the lift lines from the loft blocks and reeve them toward the arbor.

Counterweight Arbor: A weight carriage designed so that the amount of counterbalance can be varied proportional to the load imposed on the pipe batten.

Floor Block: A single groove assembly mounted under the counterweight arbor used to reeve the purchase line from the arbor bottom toward the head block.

Rope Lock: A device used to position a balanced counterweight set at the required location in the fly loft.

Purchase Line: A 3/4" diameter manila or synthetic rope that is reeved in an endless loop and tied off at the counterweight arbor.

Upright vs. Underhung:

The type of counterweight rigging system installed is dependent on the structural support system provided by the architect and engineer. Existing facilities will dictate specific equipment and in some cases, accommodations may be needed to adjust to field conditions. When a new facility is planned, the most useful style of counterweight rigging system is an underhung system with a grid. This style

allows the majority of the counterweight rigging system to be mounted to the same structural members that support the roof while also providing a walking grid. A grid is an open framework of steel located under the roof for the support of stage rigging equipment. The grid provides a position to access the underhung rigging for inspection and maintenance. It is also an uncluttered area for the placement of specialty rigging sets or spotline rigging required for specific theatrical productions.

Upright counterweight rigging systems have a steel grid for the attachment of loft blocks and a separate raised head block beam. From the position of the head block, the cables array downward toward the loft blocks. On a fully rigged stage, accessibility across the grid becomes limited. It becomes more difficult to perform periodic inspection and maintenance of the system after installation. Also, placement of specialty rigging sets and spotline rigging required for specific theatrical productions becomes hindered.

Theatre spaces must be adaptable. In most cases, the stage is multi-use and must accommodate many functions from speech, music, dance, and drama. In addition, each theatrical production is unique and requires equipment to fly a different complement of masking draperies, scenery, and effects.

Wire Guide vs. Rigid Guide Systems:

Two styles of arbor guide systems are currently in use, wire guide and rigid guide. Wire guide systems are more economical and can be used when there is adequate clearance around arbors, and the length of the guide wires does not exceed 30 feet. Rigid guide systems can be used in applications of any length.

Single Purchase vs. Double Purchase

Counterweight arbors may either be reeved on a 1:1 (single purchase) or 2:1 (double purchase) basis. A single purchase arbor is the most efficient. In this system, for each foot of arbor travel, the batten also travels one foot. To accomplish this, one pound of counterweight is added to the arbor for each pound of load weight added to the pipe batten.

When the required travel of the pipe batten cannot be accomplished with a single purchase arbor due to an obstruction or other limitation, a double purchase arbor is used. In this system, for each foot of arbor travel, the batten travels two feet. To accomplish this, two pounds of counterweight are added to the arbor for each pound of load weight added to the pipe batten. For a given batten load, the arbor must be much longer and the efficiency of the counterweight set is diminished, resulting in more effort required to raise or lower a balanced set. The structure must be designed to accommodate the increased loads.

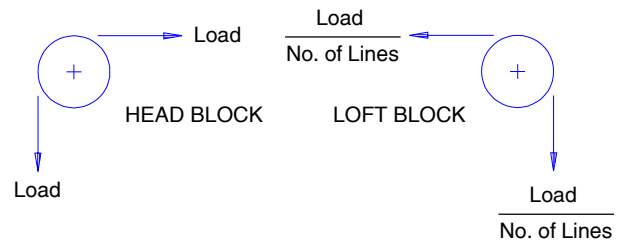
Working Load Limits:

The working load limits listed in this catalog have been arrived at through a combination of empirical data, technical analysis and standardized service factors. In general, assemblies are manufactured for a minimum 5:1 design factor, and bearings sized for two times the design load at a cable speed of 300 feet/minute for 2000 hours. Groove pressure is limited to 480 psi for cast iron, 800 psi for Nylatron GS and 1000 psi for Nylatron GSM. All working load limits are expressed in pounds of cable tension, assuming a 90 degree cable wrap. In no case does the working load

limit of a block assembly exceed 1/8 the breaking strength of the cable for which it is designed (7x19 galvanized aircraft cable).

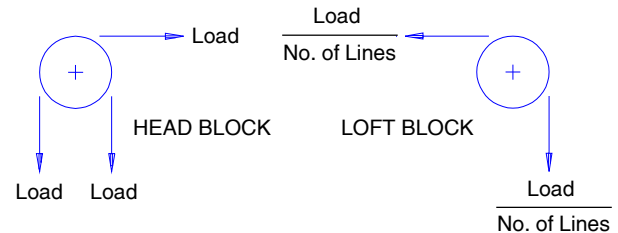
The resultant load imposed onto the building structure can be calculated as follows:

Single Purchase System



Stage rigging equipment imparts both vertical and lateral loads on head and loft block support beams. The head block beams must support the entire batten load + the dead load of the head block. Loft block loads will vary dependant upon distribution of weight on pipe batten.

Double Purchase System



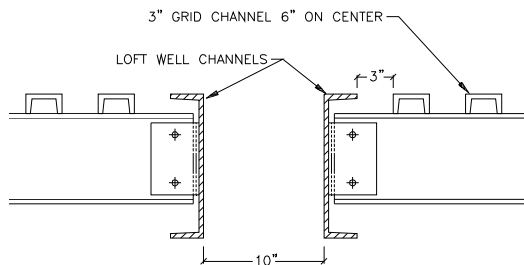
The head block beams must support the batten load laterally and twice the batten load vertically + the dead load of the head block. Loft block loads will vary dependant upon distribution of weight on pipe batten.

Modifications:

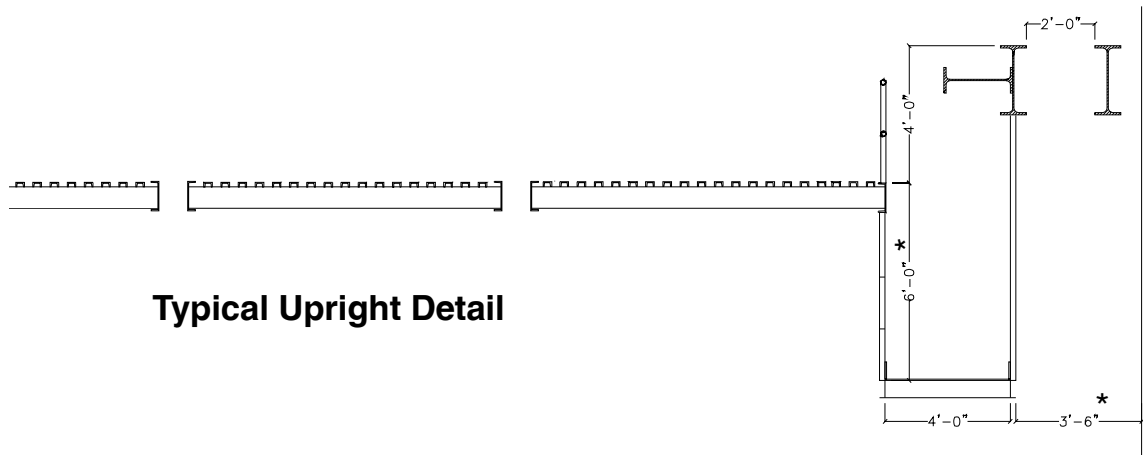
Illustrated in this catalog are the most common types of counterweight rigging equipment used in the theatre. Whenever possible, care has been taken to design equipment that will suit a variety of field conditions. When conditions exist where more specialized equipment is required, it can be manufactured to suit the unique requirements of a particular project. Consult the factory with your particular requirements.

Head and Loft Beam Details

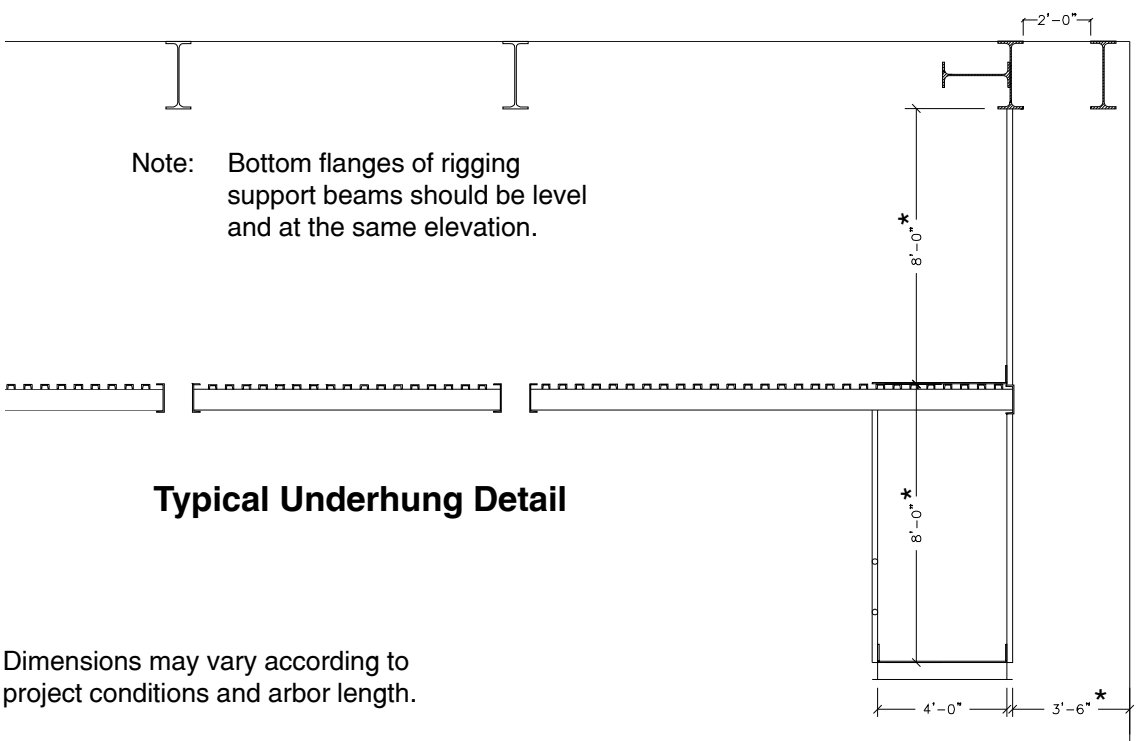
Stage rigging equipment imparts both vertical and lateral loads on head and loft block support beams. The use of the theatre space will dictate the required loads to be accommodated.



Typical Loft Well Detail



Typical Upright Detail



Note: Bottom flanges of rigging support beams should be level and at the same elevation.

Typical Underhung Detail

* Dimensions may vary according to project conditions and arbor length.

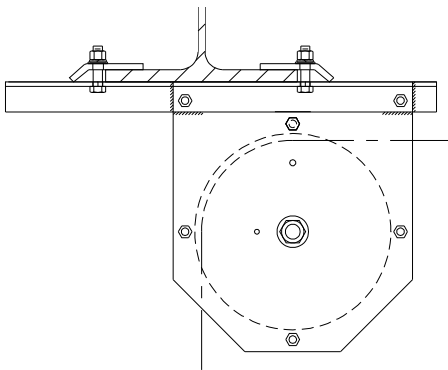
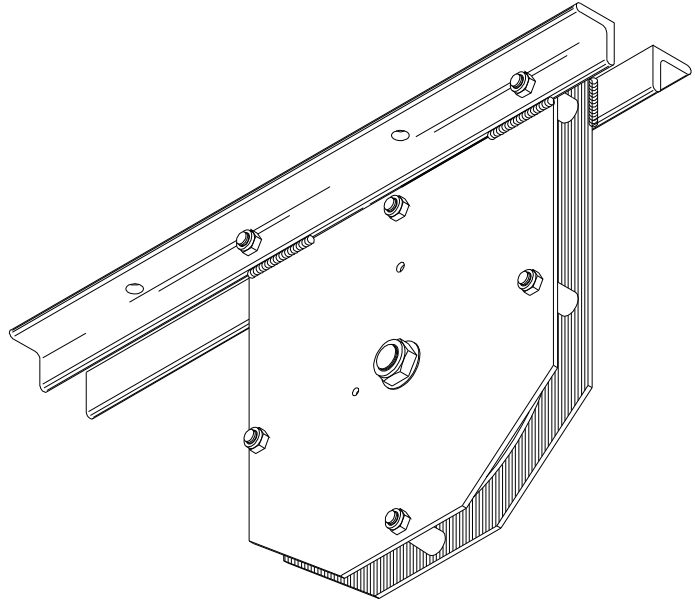


LOFT BLOCKS:

Loft blocks are used in groups for raising or lowering pipe battens. Lift lines reeve from the pipe batten around the loft block and toward the head block. Loft blocks may also be used singly or spotted on the grid for special applications.

Series 30 Underhung Loft Blocks

Series 30 loft blocks are designed to clamp to the bottom of steel wide flange beams. Single-groove sheave rotating on sealed precision ball bearings is fully enclosed in a housing of heavy steel side plates welded to base angles.



Typical Mounting Application

Each series 30 loft block is fabricated to fit a specific beam size. Mounting holes are located such that the lift line is positioned at the center of the beam. Offset clips and bolts are supplied for attachment to the support structure. Beam flange width and thickness must be specified at time of ordering.

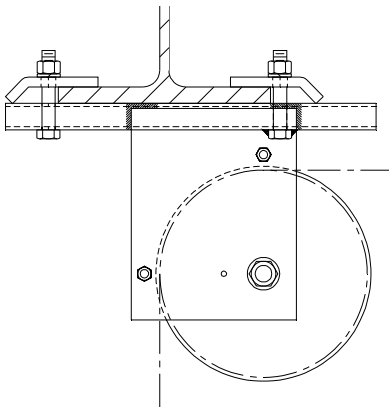
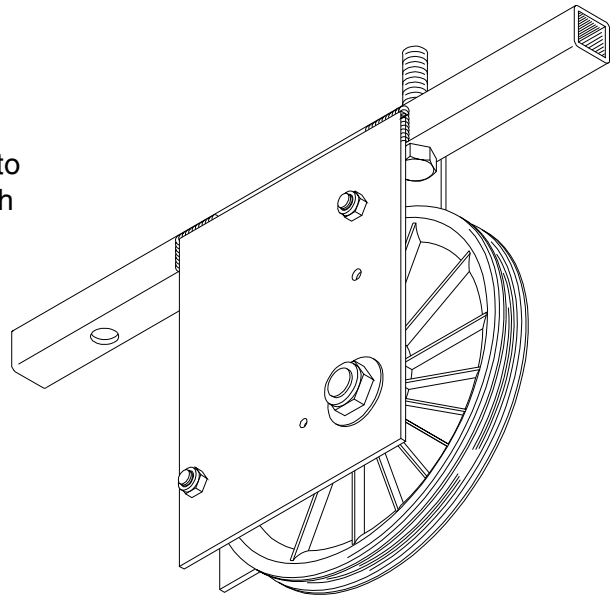
Model Number	Sheave Diameter	Sheave Material	Groove Size	Standard Bearing	Working Load Limit*
630N19	6"	Nylatron GS	3/16"	5/8" BB	400
630N50	6"	Nylatron GS	1/2"	5/8" BB	250
830C25	8"	Cast Iron	1/4"	5/8" BB	450
830C75	8"	Cast Iron	3/4"	5/8" BB	400
830N19	8"	Nylatron GS	3/16"	5/8" BB	525
830N25	8"	Nylatron GS	1/4"	5/8" BB	725
1030C25	10"	Cast Iron	1/4"	5/8" BB	550
1030C31	10"	Cast Iron	5/16"	5/8" BB	690
1030C75	10"	Cast Iron	3/4"	5/8" BB	500
1030N25	10"	Nylatron GSM	1/4"	1" BB	875
1030N31	10"	Nylatron GSM	5/16"	1" BB	1150
1230C25	12"	Cast Iron	1/4"	1" BB	700
1230C38	12"	Cast Iron	3/8"	1" BB	1025
1230N25	12"	Nylatron GSM	1/4"	1" BB	875
1230N38	12"	Nylatron GSM	3/8"	1" BB	1500

BB - Sealed precision ball bearings. Tapered roller bearings available.

*Weight in pounds @ 300 ft/min

Series 32 Underhung Loft Blocks

Series 32 loft blocks are designed to clamp to the bottom of steel wide flange beams. Each rigid steel housing contains a single-groove sheave rotating on sealed precision ball bearings.



Typical Mounting Application

Each series 32 loft block is fabricated to fit a specific beam size. Mounting holes are located such that the lift line is positioned at the center of the beam. Offset clips and bolts are supplied for attachment to the support structure. Beam flange width and thickness must be specified at time of ordering.

Model Number	Sheave Diameter	Sheave Material	Groove Size	Standard Bearing	Working Load Limit*
632N19	6"	Nylatron GS	3/16"	5/8" BB	400
632N50	6"	Nylatron GS	1/2"	5/8" BB	250
832C25	8"	Cast Iron	1/4"	5/8" BB	450
832N19	8"	Nylatron GS	3/16"	5/8" BB	525
832N25	8"	Nylatron GS	1/4"	5/8" BB	725

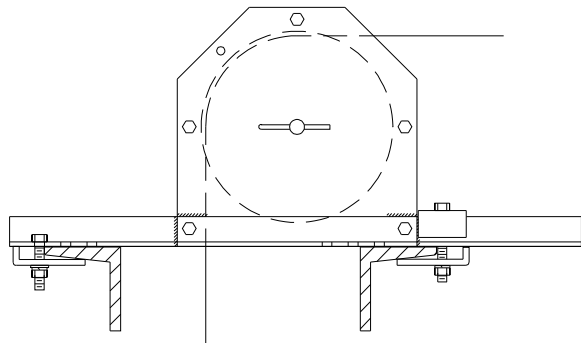
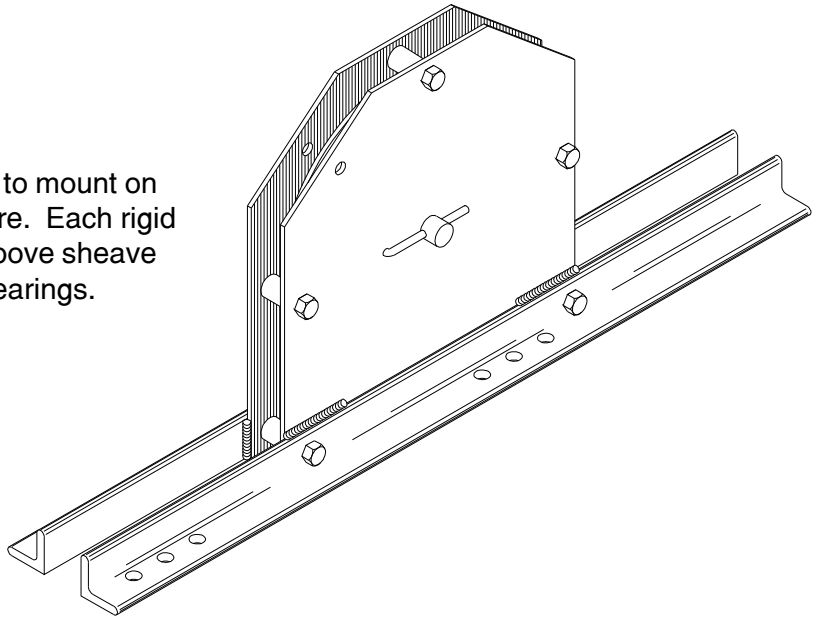
BB - Sealed precision ball bearings. Tapered roller bearings available.

*Weight in pounds @ 300 ft/min



Series 40 Upright Loft Blocks

Series 40 loft blocks are designed to mount on top of grid or other support structure. Each rigid steel housing contains a single-groove sheave rotating on sealed precision ball bearings.



Typical Mounting Application

Each base angle is punched with a series of holes to accommodate a wide variety of loft well configurations. Mounting clips and bolts are supplied for attachment to the support structure.

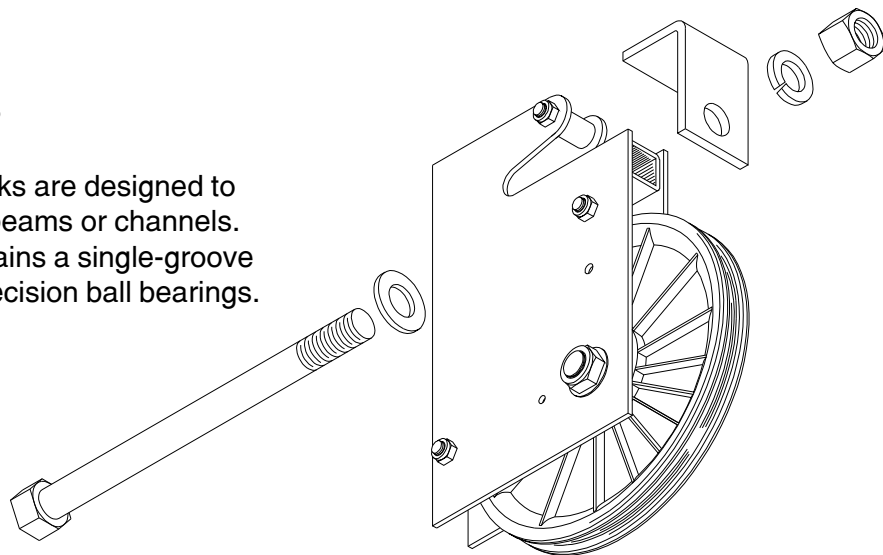
Model Number	Sheave Diameter	Sheave Material	Groove Size	Standard Bearing	Working Load Limit*
640N19	6"	Nylatron GS	3/16"	5/8" BB	400
640N50	6"	Nylatron GS	1/2"	5/8" BB	250
840C25	8"	Cast Iron	1/4"	5/8" BB	450
840C75	8"	Cast Iron	3/4"	5/8" BB	400
840N19	8"	Nylatron GS	3/16"	5/8" BB	525
840N25	8"	Nylatron GS	1/4"	5/8" BB	725
1040C25	10"	Cast Iron	1/4"	5/8" BB	550
1040C31	10"	Cast Iron	5/16"	5/8" BB	690
1040C75	10"	Cast Iron	3/4"	5/8" BB	500
1040N25	10"	Nylatron GSM	1/4"	1" BB	875
1040N31	10"	Nylatron GSM	5/16"	1" BB	1150
1240C25	12"	Cast Iron	1/4"	1" BB	700
1240C38	12"	Cast Iron	3/8"	1" BB	1025
1240N25	12"	Nylatron GSM	1/4"	1" BB	875
1240N38	12"	Nylatron GSM	3/8"	1" BB	1500

BB - Sealed precision ball bearings. Tapered roller bearings available.

*Weight in pounds @ 300 ft/min

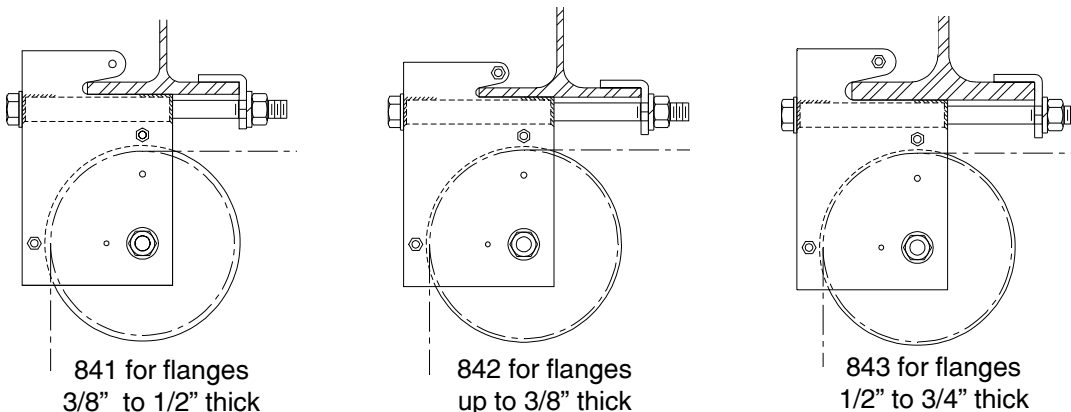
Series 41, 42, 43 Underhung Loft Blocks

Series 41, 42 and 43 loft blocks are designed to clamp to the bottom of steel beams or channels. Each rigid steel housing contains a single-groove sheave rotating on sealed precision ball bearings.



Series 41 loft blocks attach to beam flanges from 3/8" to 1/2" thick, Series 42 loft blocks attach to beam flanges up to 3/8" thick and Series 43 loft blocks attach to beam flanges from 1/2" to 3/4" thick. Offset clips and bolts are supplied for attachment to the support structure. Beam flange width and thickness must be specified at time of ordering.

Typical Mounting Applications



Model Number	Sheave Diameter	Sheave Material	Groove Size	Standard Bearing	Working Load Limit*
841C25	8"	Cast Iron	1/4"	5/8" BB	450
841N19	8"	Nylatron GS	3/16"	5/8" BB	525
841N25	8"	Nylatron GS	1/4"	5/8" BB	725
842C25	8"	Cast Iron	1/4"	5/8" BB	450
842N19	8"	Nylatron GS	3/16"	5/8" BB	525
842N25	8"	Nylatron GS	1/4"	5/8" BB	725
843C25	8"	Cast Iron	1/4"	5/8" BB	450
843N19	8"	Nylatron GS	3/16"	5/8" BB	525
843N25	8"	Nylatron GS	1/4"	5/8" BB	725

BB - Sealed precision ball bearings. Tapered roller bearings available.

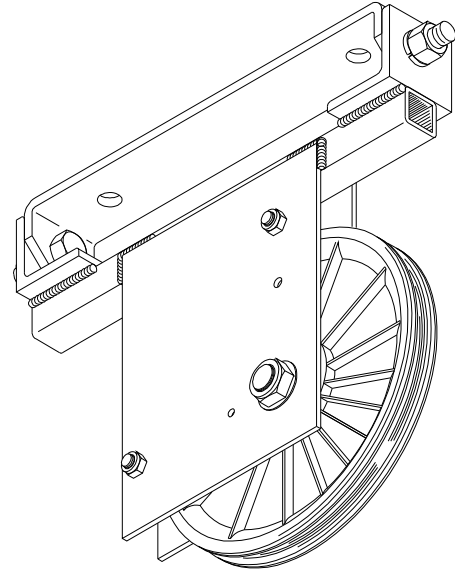
*Weight in pounds @ 300 ft/min



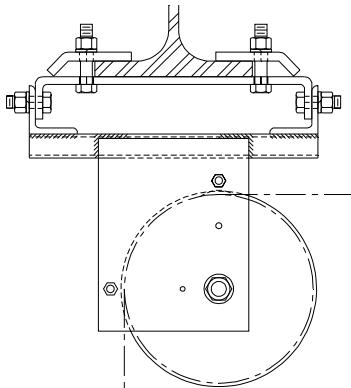
Series 44 and 46 Specialty Underhung Loft Blocks

Specialty loft blocks are used when unusual mounting conditions exist. Series 44 pivot blocks are used when the support structure is not installed level. Series 46 and 47 swivel blocks are used when the lift lines are not run perpendicular to the support. Each rigid steel housing contains a single-groove sheave rotating on sealed precision ball bearings.

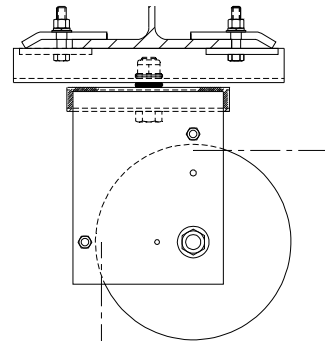
Each series 44 pivot block and 46 swivel block is fabricated to fit a specific beam size. Offset clips and mounting bolts are supplied for attachment to the support structure. Beam flange width and thickness must be specified at time of ordering.



Typical Mounting Applications



Series 44
Pivot Blocks



Series 46
Swivel Blocks

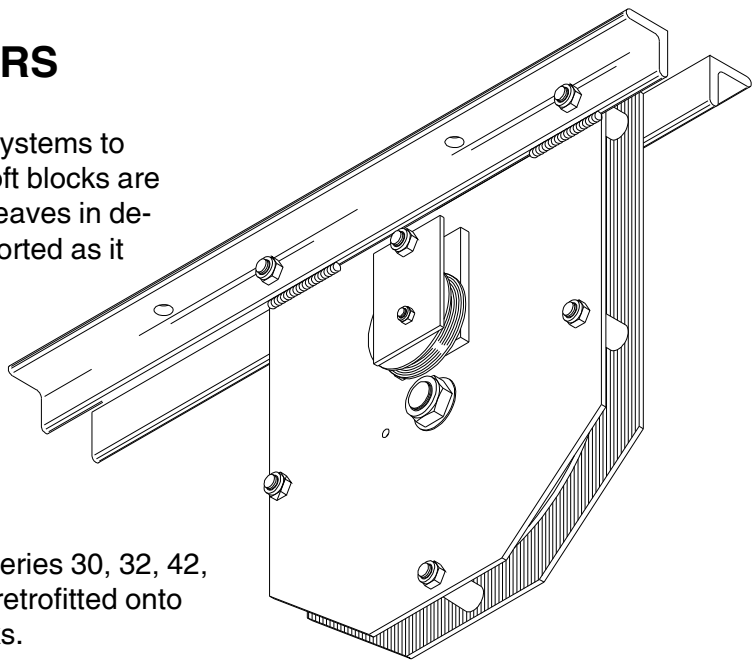
Model Number	Sheave Diameter	Sheave Material	Groove Size	Standard Bearing	Working Load Limit*
644N19	6"	Nylatron GS	3/16"	5/8" BB	400
644N50	6"	Nylatron GS	1/2"	5/8" BB	250
844C25	8"	Cast Iron	1/4"	5/8" BB	450
844N19	8"	Nylatron GS	3/16"	5/8" BB	525
844N25	8"	Nylatron GS	1/4"	5/8" BB	550
646N19	6"	Nylatron GS	3/16"	5/8" BB	400
646N50	6"	Nylatron GS	1/2"	5/8" BB	250
846C25	8"	Cast Iron	1/4"	5/8" BB	450
846N19	8"	Nylatron GSM	3/16"	5/8" BB	500
846N25	8"	Nylatron GSM	1/4"	5/8" BB	500

BB - Sealed precision ball bearings. Tapered roller bearings available.

*Weight in pounds @ 300 ft/min. Field welding to building structure may be required to attain full load rating.

LOFT BLOCK IDLERS

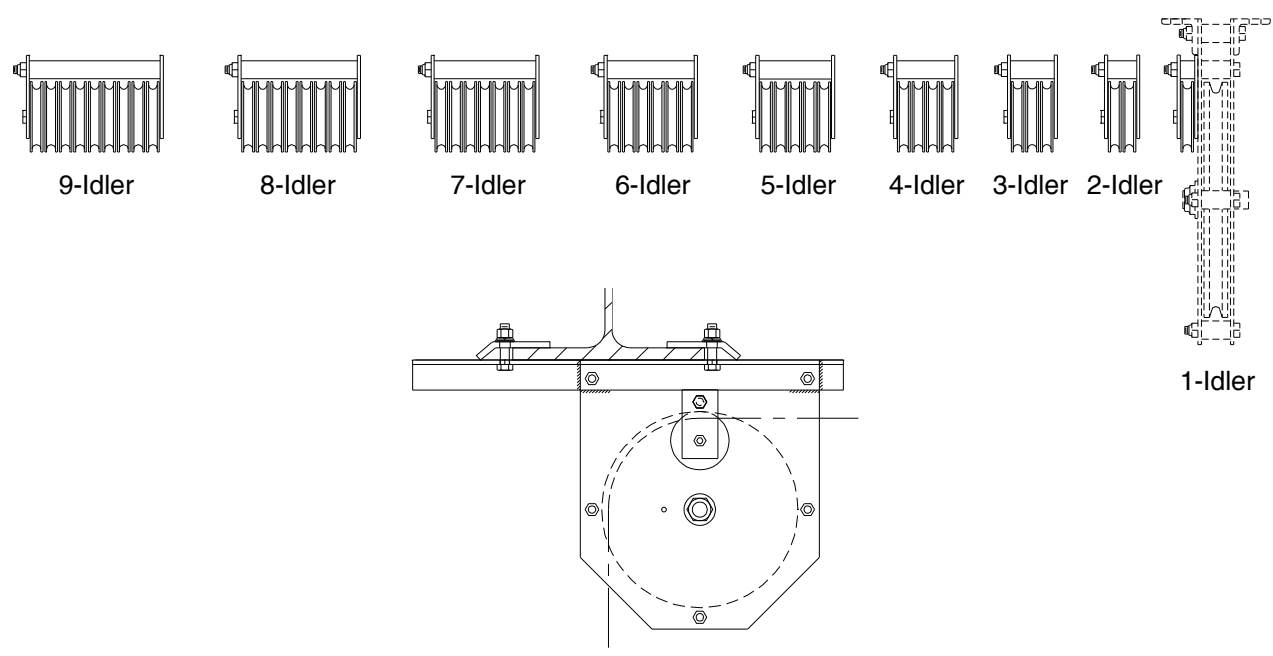
Idlers are commonly used in underhung systems to reduce cable sag and eliminate noise. Loft blocks are outfitted with Nylatron GS ball bearing sheaves in descending quantities. Each lift line is supported as it passes adjacent to the loft block.



Idler assemblies are factory installed on series 30, 32, 42, 43 and 44 loft blocks. They may also be retrofitted onto many existing H & H Specialties loft blocks. Contact the factory for further information.

Model 830N25 with 1 Idler

Typical Idlers



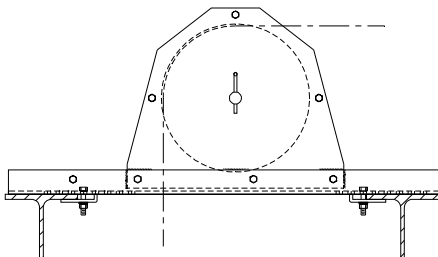
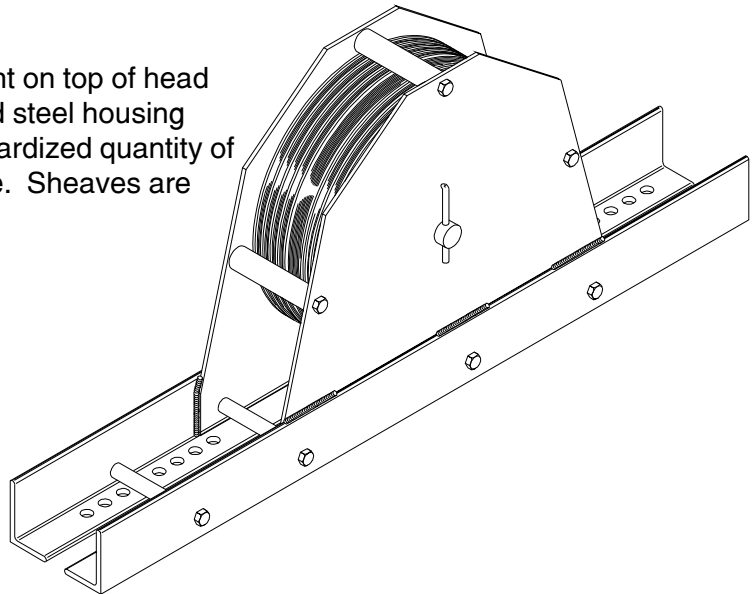


HEAD BLOCKS

Head blocks are located at the upper portion of the counterweight system above the arbor. The purpose of the head block is to gather all the lift lines from the loft blocks and reeve them toward the arbor top. The head block sheave also contains a purchase line groove to enable the operator to raise and lower a balanced set. Three styles are available to suit a variety of mounting conditions.

Series 50 Upright Head Block

Series 50 head blocks are designed to mount on top of head beams or other support structure. Each rigid steel housing contains a multi-groove sheave with a standardized quantity of cable grooves and one purchase line groove. Sheaves are available in cast iron and Nylatron GSM.



Typical Mounting Application

Each base angle is punched with a series of holes to accommodate a wide variety of head beam configurations. Mounting clips and bolts are supplied for attachment to the support structure.

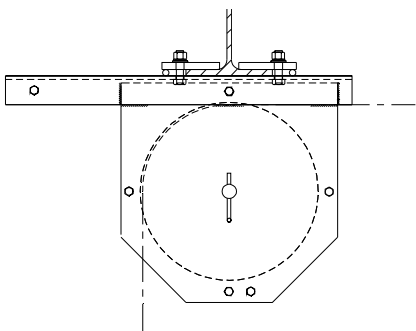
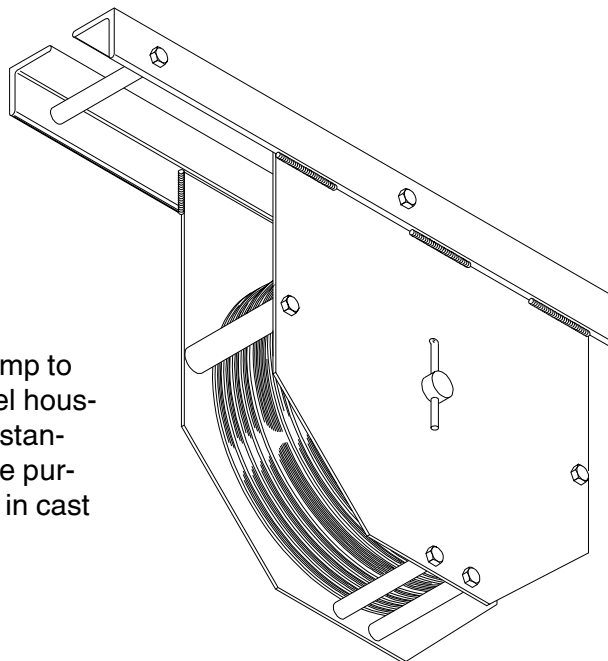
Model No.	Sheave Diameter	Sheave Material	Cable Groove Quantity	Groove Size	Standard Bearing	Working Load Limit*
6850N19	8"	Nylatron GSM	6	3/16"	1" BB	1200
7850C25	8"	Cast Iron	7	1/4"	1" TRB	1800
7850N25	8"	Nylatron GSM	7	1/4"	1" TRB	2000
61050N19	10"	Nylatron GSM	6	3/16"	1" BB	1400
71250C25	12"	Cast Iron	7	1/4"	1" TRB	1800
71250N25	12"	Nylatron GSM	7	1/4"	1" TRB	2400
101250C25	12"	Cast Iron	10	1/4"	1" TRB	1800
101250N25	12"	Nylatron GSM	10	1/4"	1" TRB	2400
71650C38	16"	Cast Iron	7	3/8"	1-3/8" TRB	2500
91650C25	16"	Cast Iron	9	1/4"	1-3/8" TRB	2500

BB - Sealed precision ball bearings
TRB - Tapered roller bearings

All sheaves include one groove for 3/4" purchase line.
*Weight in pounds @ 300 ft/min

Series 51 Underhung Head Block

Series 51 head blocks are designed to clamp to the bottom of steel beams. Each rigid steel housing contains a multi-groove sheave with a standardized quantity of cable grooves and one purchase line groove. Sheaves are available in cast iron and Nylatron GSM.



Typical Mounting Application

Each assembly is fabricated to fit a specific beam size. Mounting holes are generally located such that the sheave is positioned centered under the support beam. Heavy offset clips and bolts are supplied for attachment to the support structure. Beam flange width and thickness must be specified at time of ordering.

Model No.	Sheave Diameter	Sheave Material	Cable Groove Quantity	Groove Size	Standard Bearing	Working Load Limit*
6851N19	8"	Nylatron GSM	6	3/16"	1" BB	1200
7851C25	8"	Cast Iron	7	1/4"	1" TRB	1800
7851N25	8"	Nylatron GSM	7	1/4"	1" TRB	2000
61051N19	10"	Nylatron GSM	6	3/16"	1" BB	1400
71251C25	12"	Cast Iron	7	1/4"	1" TRB	1800
71251N25	12"	Nylatron GSM	7	1/4"	1" TRB	2400
101251C25	12"	Cast Iron	10	1/4"	1" TRB	1800
101251N25	12"	Nylatron GSM	10	1/4"	1" TRB	2400

BB - Sealed precision ball bearings
TRB - Tapered roller bearings

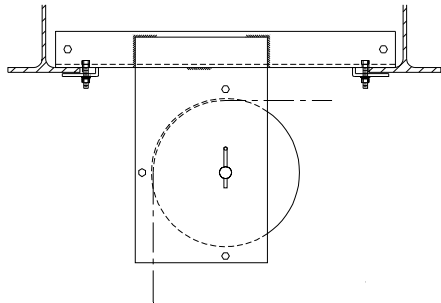
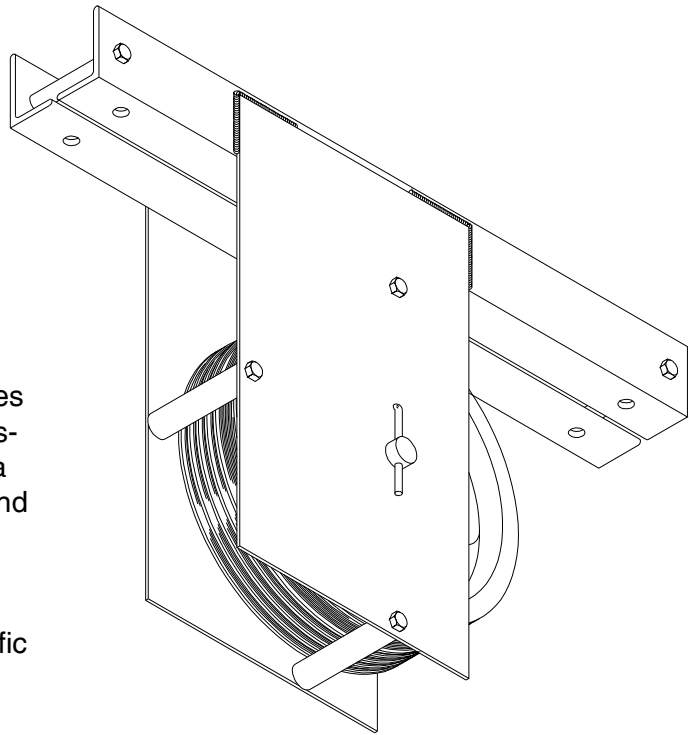
All sheaves include one groove for 3/4" purchase line.

*Weight in pounds @ 300 ft/min

Series 55 Underhung Head Block

Series 55 head blocks are designed to mount to the top side of the bottom flanges of the head beams. Each rigid steel housing contains a multi-groove sheave with a standardized quantity of cable grooves and one purchase line groove. Sheaves are available in cast iron and Nylatron GSM.

Each assembly is fabricated to fit a specific



Typical Mounting Application

beam size and spacing, therefore, accurate field dimensions are required when ordering. Holes are located in the base angles for the attachment of heavy offset clips and mounting bolts to the support structure.

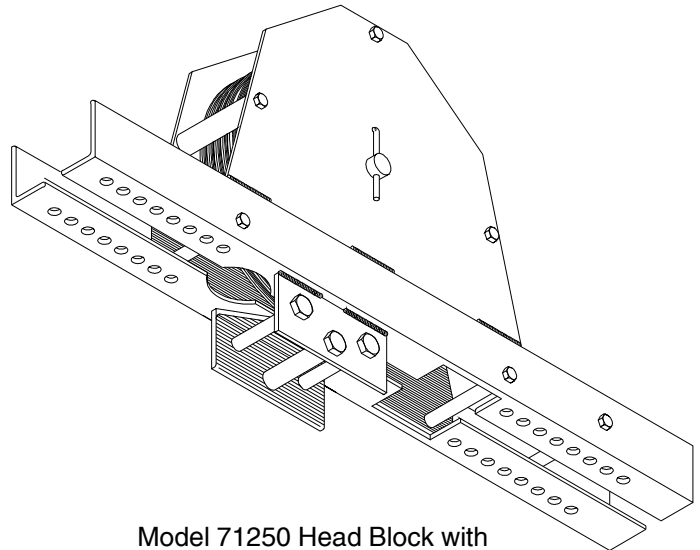
Model No.	Sheave Diameter	Sheave Material	Cable Groove Quantity	Groove Size	Standard Bearing	Working Load Limit*
6855N19	8"	Nylatron GSM	6	3/16"	1" BB	1200
7855C25	8"	Cast Iron	7	1/4"	1" TRB	1800
7855N25	8"	Nylatron GSM	7	1/4"	1" TRB	2000
71255C25	12"	Cast Iron	7	1/4"	1" TRB	1800
71255N25	12"	Nylatron GSM	7	1/4"	1" TRB	2400
101255C25	12"	Cast Iron	10	1/4"	1" TRB	1800
101255N25	12"	Nylatron GSM	10	1/4"	1" TRB	2400

BB - Sealed precision ball bearings
TRB - Tapered roller bearings

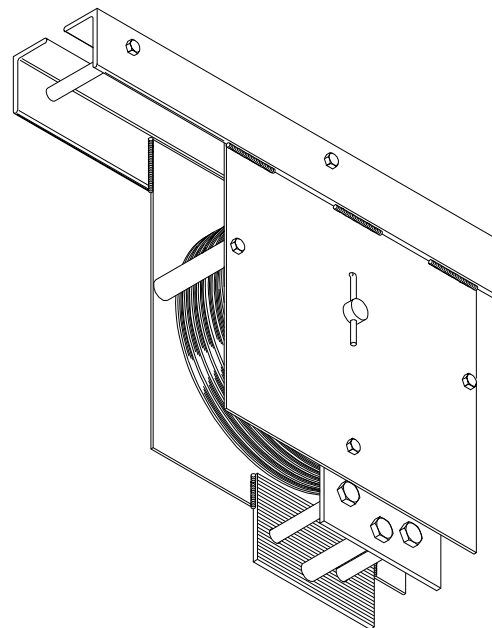
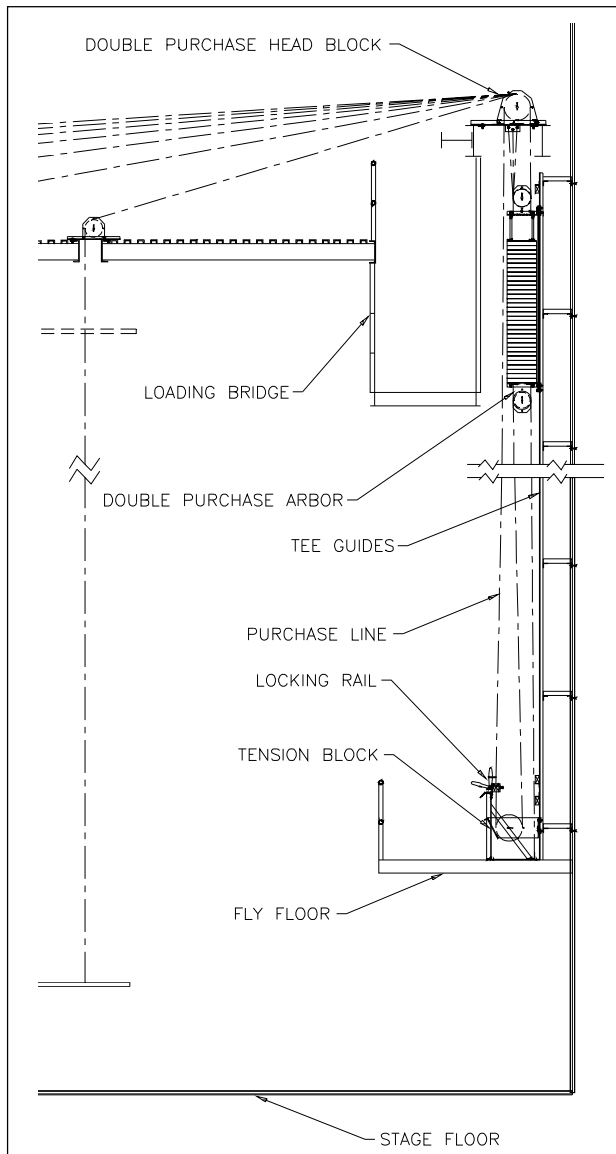
All sheaves include one groove for 3/4" purchase line.
*Weight in pounds @ 300 ft/min

Double Purchase Head Blocks

Double purchase head blocks are used when an obstruction or other limitation restricts the travel of a single purchase arbor. Used in conjunction with a double purchase arbor, this style of rigging enables the batten to travel two feet for each foot of arbor travel.



Model 71250 Head Block with
Model 50DP Double Purchase Tie-off



Model 71251 Head Block with
Model 51DP Double Purchase Tie-off

A standard Series 50, 51, or 55 head block assembly is modified by the incorporation of purchase line and lift line tie-offs. Tie-off is sold separately as a factory installed modification only. Since double purchase arbors must be sized larger than single purchase arbors, the entire head block assembly must be designed to accommodate the increased load. Care must be taken to equally space lift lines in tie-off.

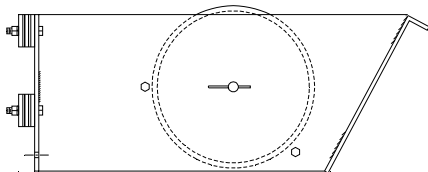
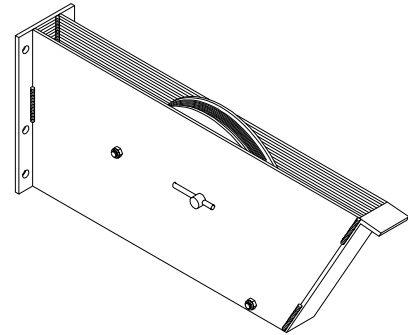


TENSION BLOCKS

Tension blocks are located in the lower portion of the counterweight system under the arbor. The tension block reeves the purchase line from the bottom of the arbor through the rope lock and over the head block and back to the arbor top. Many styles are available, including ones that include integral rope lock assemblies. All blocks equipped with cast iron sheave grooved for 3/4" purchase line and sealed precision ball bearings.

Series 70 Tension Block:

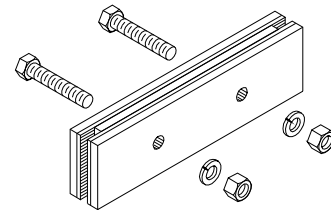
Used in tee or jay bar mounting. The heavy steel housing is designed to provide automatic tension on the purchase line. Guides may be mounted to provide either a self-locking or free-floating operation.



Model Number	Sheave Diameter	Unit Weight
1070C75	10"	42 lbs.
1270C75	12"	51 lbs.

Series 70G-Tension Block Guide Shoe

Tension block guide shoes are constructed of high density polyethylene guides with full width 1/4" thick steel backing plates. Guides may be mounted to provide either self-locking or free-floating operation. The guide material's unique characteristics provide years of trouble-free service. Guide assemblies are available in standard spacings of 6", 8", 9", and 12" centers.



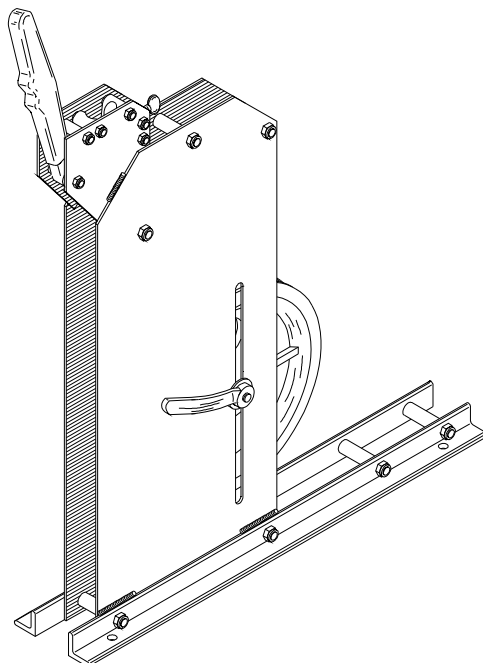
Tension Guide Number	Tee or Jay Bar* Spacing	Unit Weight per Pair
70G-6	6"	3.6 lbs.
70G-8	8"	4.8 lbs.
70G-9	9"	5.6 lbs.
70G-12	12"	7.8 lbs.

* 1-1/2" x 1-1/2" x 3/16"

Series 71 Combination Adjustable Floor Block/Rope Lock

Sheave is adjustable in the housing to provide proper tension on the purchase line. These units are designed for use with wire guide, rigid guide, and lattice track installations where an integral rope lock is desired.

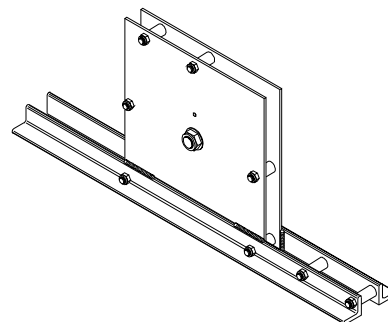
- Model 1071C75** 10" diameter sheave.
- Model 1271C75** 12" diameter sheave.



Series 73 Wire Guide Floor Block

Floor block assembly is designed for use with #579 Wire Guide Locking Rail. Housing has tie-offs for use with wire guide arbors. No provision is provided for adjustment of purchase line.

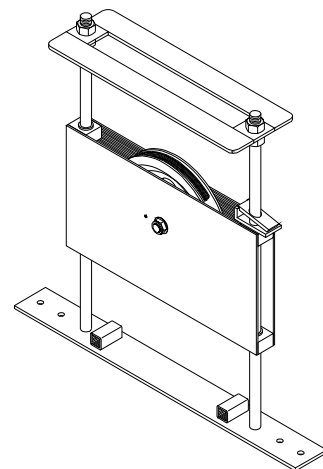
- Model 873C75** 8" diameter sheave.



Series 74 Sliding Tension Block

Used most often with fire curtains, act curtains, and paint frames. Designed to provide automatic tension on the purchase line. Self-locking feature prevents upward travel of sheave housing unless manually released.

- Model 1074C75** 10" diameter sheave.
- Model 1274C75** 12" diameter sheave.





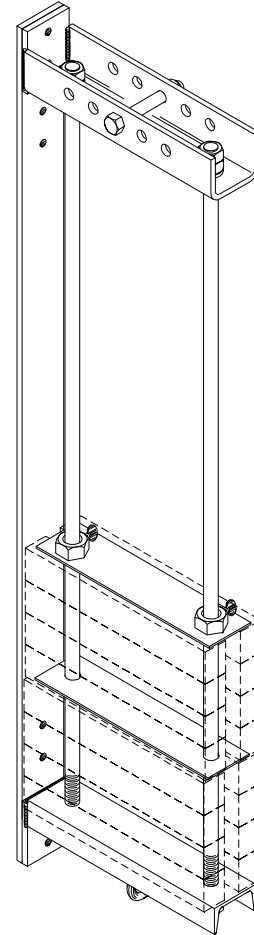
Arbors

An arbor is a carriage that is designed to hold counterweights to balance the load on a pipe batten. Once an arbor is loaded properly, it can be raised or lowered with a minimum amount of effort. Arbors are available in many styles depending on the application and budgetary concerns.

Series 991 Tee Guide Arbors

Series 991 counterweight arbors are designed to be captured and guided between tee or jay bar. They are available in one foot increments from 4 to 12 feet.

Each Series 991 counterweight arbor is fabricated from heavy steel shapes to provide a sturdy frame in which to load counterweights. Arbor rods are spaced 10" on center. Guides, described on the following page, are sold separately.

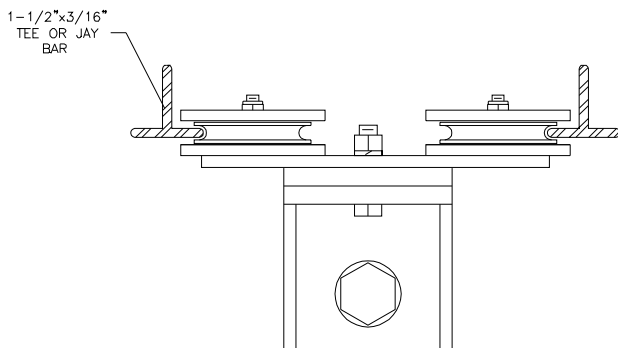
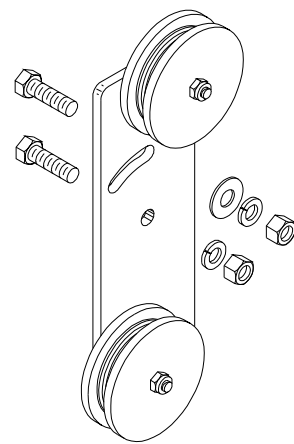


Model Number	Rod Length	Empty Weight	Capacity* 4" Wide Weights	Capacity* 6" Wide Weights	Spreader Plate Quantity
991x4	4 feet	50 lbs.	565 lbs.	835 lbs.	2
991x5	5 feet	67 lbs.	740 lbs.	1100 lbs.	3
991x6	6 feet	74 lbs.	915 lbs.	1365 lbs.	3
991x7	7 feet	81 lbs.	1090 lbs.	1630 lbs.	4
991x8	8 feet	89 lbs.	1265 lbs.	1895 lbs.	4
991x9	9 feet	96 lbs.	1440 lbs.	2160 lbs.	5
991x10	10 feet	104 lbs.	1615 lbs.	2425 lbs.	5
991x11	11 feet	111 lbs.	1790 lbs.	2690 lbs.	6
991x12	12 feet	118 lbs.	1965 lbs.	2955 lbs.	6

* Capacities include the empty weight of the arbor and are calculated based on an industry average for cut steel counterweights. Actual capacities may vary by as much as 5%.

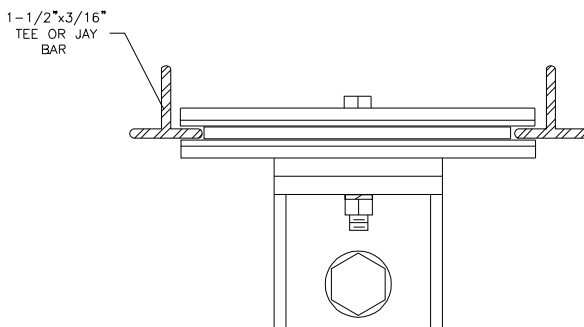
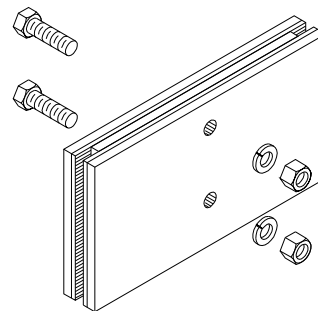
Model 991RG Ball Bearing Roller Guide

Special ball bearing Nylatron GS guide wheels enable the arbor to roll instead of slide along guide tracks. This guide assembly provides the ultimate in ease in operation for a rigid guide system. Guide assemblies are adjustable for spacings of 6" or 8" centers. These guides may also be retrofitted onto existing counterweight arbors.



Series 991G- Arbor Guide Shoe

Arbor guide shoes are constructed of high density polyethylene guides with full width 1/4" thick steel backing plates to capture the counterweight arbor. These guides enable the arbor to glide freely along steel tee or aluminum jay bar guides. The guide material's unique characteristics provide years of trouble-free service. Guides are available in standard spacings of 6", 8", 9", and 12" centers.



Arbor Guide Model	Tee or Jay Bar* Spacing	Unit Weight per Pair
991RG	6" to 8"	7.6 lbs.
991G-6	6"	7.2 lbs.
991G-8	8"	9.4 lbs.
991G-9	9"	10.6 lbs.
991G-12	12"	14.6 lbs.

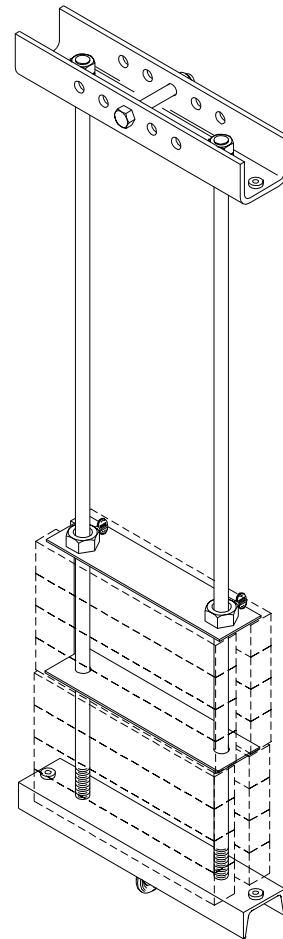
* 1-1/2" x 1-1/2" x 3/16"



Series 992 Wire Guide Arbor

Series 992 counterweight arbors are utilized when cost is a consideration. However, length of the guide wires must not exceed 30 feet. Adequate clearance between arbors and the building structure should be maintained. Replaceable Nylatron GS guide bushings are provided on top and bottom for smooth, quiet operation.

Each Series 992 counterweight arbor is fabricated from heavy steel shapes to provide a sturdy frame in which to load counterweights. Arbor rods are spaced 10" on center. They are available in one foot increments from 4 to 10 feet.



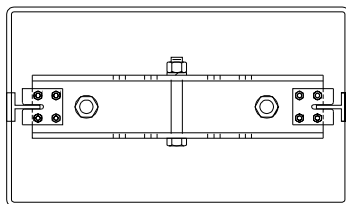
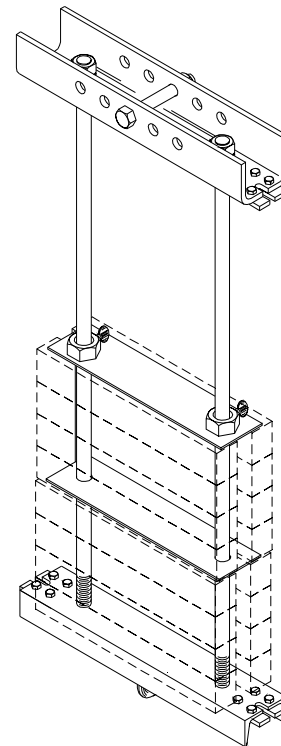
Model Number	Rod Length	Empty Weight	Capacity* 4" Wide Weights	Capacity* 6" Wide Weights	Spreader Plate Quantity
992x4	4 feet	35 lbs.	545 lbs.	815 lbs.	2
992x5	5 feet	38 lbs.	715 lbs.	1075 lbs.	3
992x6	6 feet	42 lbs.	885 lbs.	1335 lbs.	3
992x7	7 feet	45 lbs.	1055 lbs.	1595 lbs.	4
992x8	8 feet	49 lbs.	1225 lbs.	1855 lbs.	4
992x9	9 feet	52 lbs.	1395 lbs.	2115 lbs.	5
992x10	10 feet	56 lbs.	1565 lbs.	2375 lbs.	5

* Capacities include the empty weight of the arbor and are calculated based on an industry average for cut steel counterweights. Actual capacities may vary by as much as 5%.

Series 993 Lattice Track Arbor

Lattice track arbors are most often used in conjunction with fire safety curtains, act curtains, and paint frames. The arbor assembly is captured and guided between opposing steel tees in a separate system independent of the tee or jay bar wall.

Each Model 993 counterweight arbor is fabricated from heavy steel shapes to provide a sturdy frame in which to load counterweights. Arbor rods are spaced 10" on center. They are available in one foot increments from 4 to 10 feet.



Series 993 Arbor in No. 660 Lattice Track
Plan View

Model Number	Rod Length	Empty Weight	Capacity* 4" Wide Weights	Capacity* 6" Wide Weights	Spreader Plate Quantity
993x4	4 feet	36 lbs.	545 lbs.	815 lbs.	2
993x5	5 feet	39 lbs.	715 lbs.	1075 lbs.	3
993x6	6 feet	43 lbs.	885 lbs.	1335 lbs.	3
993x7	7 feet	46 lbs.	1055 lbs.	1595 lbs.	4
993x8	8 feet	50 lbs.	1225 lbs.	1855 lbs.	4
993x9	9 feet	53 lbs.	1395 lbs.	2115 lbs.	5
993x10	10 feet	57 lbs.	1565 lbs.	2375 lbs.	5

* Capacities include the empty weight of the arbor and are calculated based on an industry average for cut steel counterweights. Actual capacities may vary by as much as 5%.

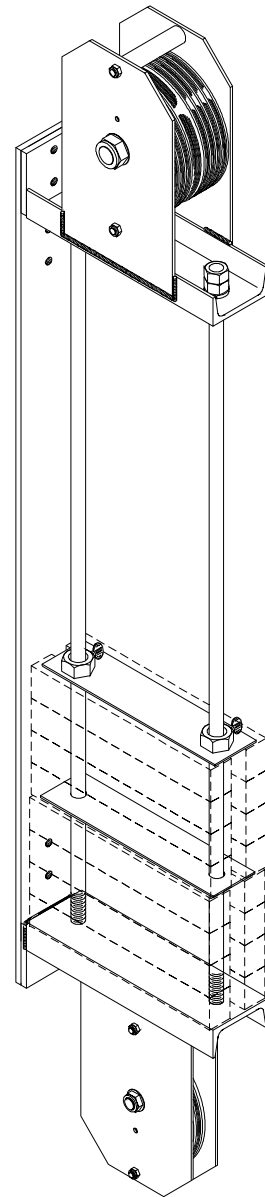


**Series 991C
Series 991N
Tee Guide Double Purchase Arbors**

Double purchase rigging is used when arbor travel is restricted. For each foot of arbor travel, the batten travels two feet. In order to balance the load on the pipe batten, two pounds of counterweight must be added for each pound of load on the pipe batten. The efficiency of this style of arbor is diminished, resulting in more effort required to raise or lower a balanced set.

Model 991C and 991N double purchase counterweight arbors are designed to be captured and guided between tee or jay bar. Each arbor is fabricated from heavy steel shapes to provide a sturdy frame in which to load counterweight. Arbor rods are spaced 10" on center. They are available in increments from 6 to 12 feet. Guides, described on page 19, are sold separately.

The arbor top is outfitted with a sheave assembly to reeve the lift and purchase lines back toward the head block. The arbor bottom is outfitted with a sheave assembly to reeve the purchase line from the tension block back toward the floor. Provisions must be made for a separate tie-off of the lift and purchase lines at the head block and the purchase line at the floor area.



Model Number	Rod Length	Top Sheave Material	Cable Groove Quantity	Empty Weight	Capacity* 4" Wide Weights	Capacity* 6" Wide Weights	Spreader Plate Quantity
991C7x8	8 feet	Cast Iron	7	157 lbs.	1335 lbs.	1965 lbs.	4
991N7x8	8 feet	Nylatron GSM	7	139 lbs.	1315 lbs.	1945 lbs.	4
991N10x8	8 feet	Nylatron GSM	10	175 lbs.	1350 lbs.	1980 lbs.	4
991C7x10	10 feet	Cast Iron	7	174 lbs.	1685 lbs.	**	5
991N7x10	10 feet	Nylatron GSM	7	156 lbs.	1665 lbs.	2480 lbs.	5
991N10x10	10 feet	Nylatron GSM	10	197 lbs.	1710 lbs.	2520 lbs.	5
991C7x12	12 feet	Cast Iron	7	191 lbs.	2035 lbs.	**	6
991N7x12	12 feet	Nylatron GSM	7	173 lbs.	2015 lbs.	**	6
991N10x12	12 feet	Nylatron GSM	10	219 lbs.	2070 lbs.	**	6

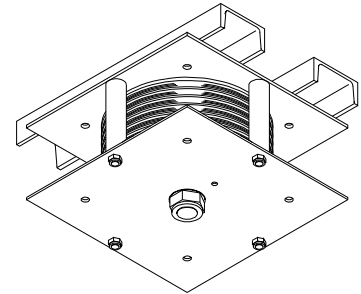
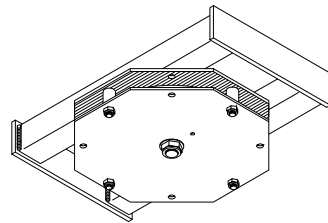
* Capacities include the weight of the arbor and are calculated based on an industry average for cut steel counterweights. Actual capacities may vary by as much as 5%.

** Contact the factory for modified arbors designed for heavy duty use. All sheaves include one groove for 3/4" purchase line.

MULE BLOCKS

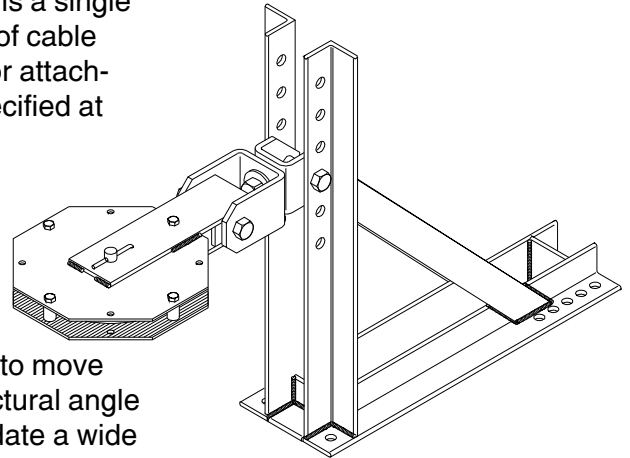
Mule blocks are designed to change direction of the lift line between the loft block and head block. Mounting conditions vary and the applied load needs to be considered in every application.

Series 81 Mule Block



This style of mule block attaches to the bottom flange of the roof support structure. Each rigid sheave housing contains a single or multi-groove sheave with a standardized quantity of cable grooves. Heavy offset clips and bolts are supplied for attachment. Beam flange width and thickness must be specified at time of ordering.

Series 83 Swivel Mule Block



The swivel/pivot mechanism enables the mule block to move up/down and left/right for maximum flexibility. A structural angle stand is provided with a series of holes to accommodate a wide variety of mounting configurations. Each sheave housing contains a single or multi-groove sheave with a standardized quantity of cable grooves. Bolts are supplied to attach the stand to the grid.

Model Number	Sheave Diameter	Sheave Material	Groove Quantity	Groove Size	Standard Bearing	Working Load Limit*
1681N19	6"	Nylatron GS	1	3/16"	5/8" BB	275
1881C25	8"	Cast Iron	1	1/4"	5/8" BB	325
1881N25	8"	Nylatron GS	1	1/4"	5/8" BB	500
4881C25	8"	Cast iron	4	1/4"	11/16" TRB	1000
6681N19	6"	Nylatron GSM	6	3/16"	1" BB	850
8881C25	8"	Cast Iron	8	1/4"	1" TRB	1250
8881N25	8"	Nylatron GSM	8	1/4"	1" TRB	1400
1683N19	6"	Nylatron GS	1	3/16"	5/8" BB	275
1883C25	8"	Cast Iron	1	1/4"	5/8" BB	325
1883N25	8"	Nylatron GS	1	1/4"	5/8" BB	500
4883C25	8"	Cast iron	4	1/4"	11/16" TRB	1000
6683N19	6"	Nylatron GSM	6	3/16"	1" BB	850
8883C25	8"	Cast Iron	8	1/4"	1" TRB	1250
8883N25	8"	Nylatron GSM	8	1/4"	1" TRB	1400

* Weight in pounds @ 300 ft/min, assuming 180° cable wrap. Field welding to building structure may be required to attain full load rating. Consult factory for specific recommendations.



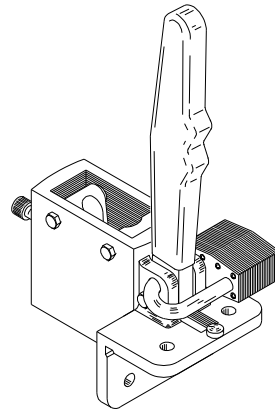
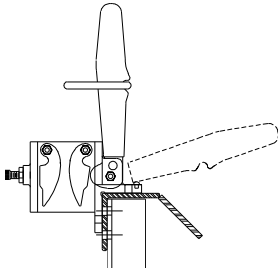
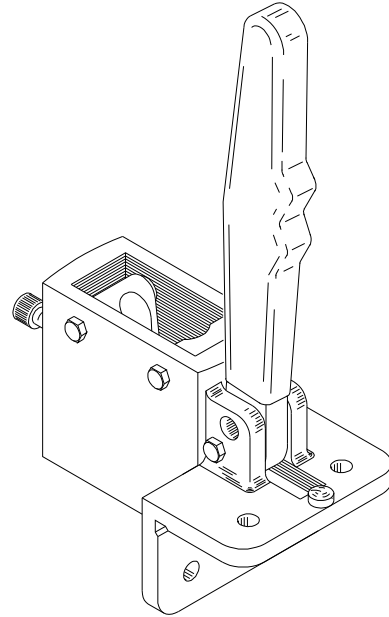
ROPE LOCKS

Rope locks are designed to position a balanced batten. While the device is designed to hold a maximum 50 pound imbalance, it should not be used as a holding device for out-of-balance sets or as a speed control device.

Model No. 576-9 Rope Lock

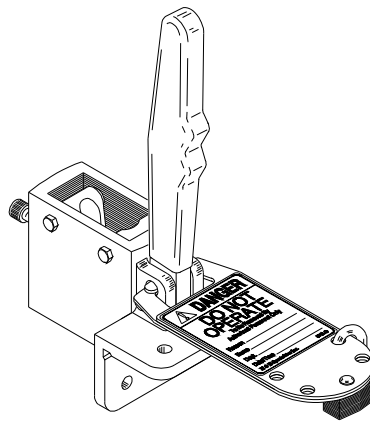
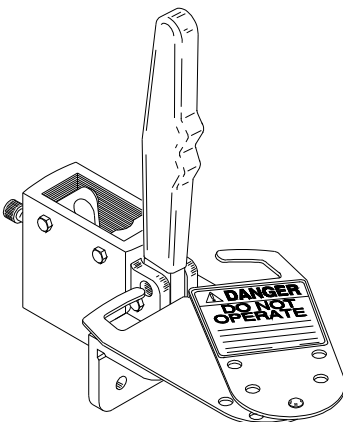
Constructed with a heavy duty ductile iron body and 9" red plastisol covered steel handle. Assembly includes gray iron jaws and red plastisol ring to keep handle from accidentally unlocking. Standard for use with 3/4" purchase lines.

Safety Lockout Tag (shown below) can also be installed on the rope lock to fix the handle in the locked position. Rope lock also comes with provision for attachment of a 3/8" shackle padlock (not included) through the body and handle of the rope lock preventing unauthorized use of the equipment.



Model No. 576LO Safety Lockout Tag

Constructed of red anodized aluminum, this device can be easily installed on our No. 576-9 Rope Lock (shown above) to prevent operation of line set by fixing the rope lock handle in the locked position. Grease pencil is used to record required information. Spaces provided for up to four padlocks. Check with local OSHA regulations for proper lockout/tagout requirements.

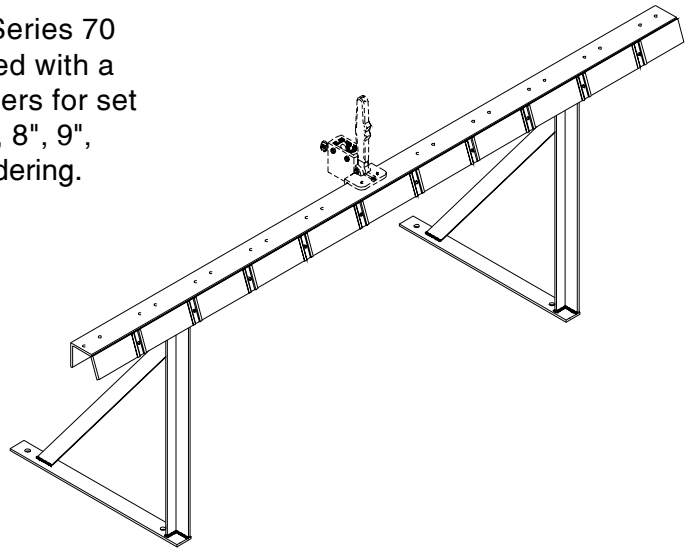


LOCKING RAILS

The locking rail is a structural assembly for mounting rope locks, located either at the stage or fly floor levels. The assembly must be adequately anchored to the structure to withstand both uplift and lateral loads.

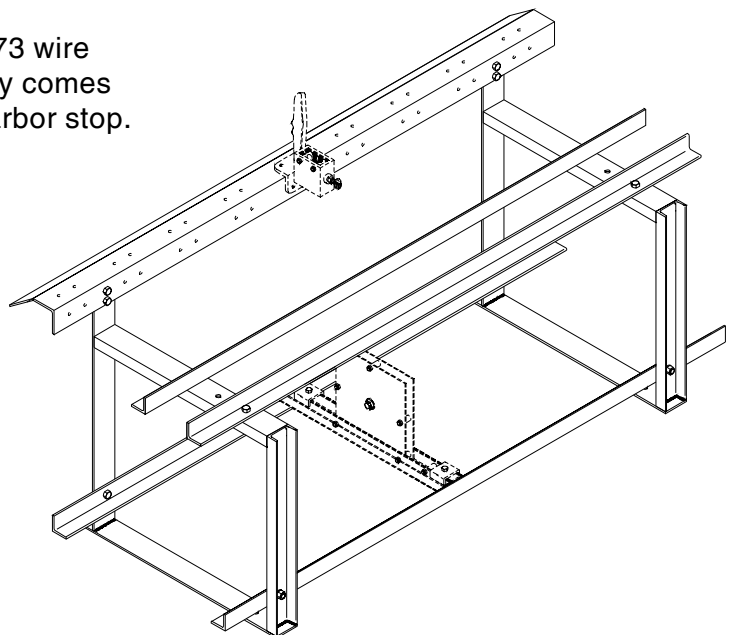
Model 578 Tee Guide Locking Rail

For use with tee and jay bar guides and Series 70 tension blocks. The locking rail is provided with a continuous index card strip and card holders for set identification. Standard set spacing is 6", 8", 9", and 12" on center. Please specify when ordering.



Model 579 Wire Guide Locking Rail

For use with wire guide systems and 873 wire guide floor block. Locking rail assembly comes complete with steel angles for bottom arbor stop.





Tee Bar Guide System

Rigid guide systems must be used on applications that exceed 30 feet. This style captures the arbor between steel tee bars

Model 662 Knee Brace

Knee braces are constructed of a two-piece assembly to enable adjustment during installation. Formed 1/4" wall bracket is attached to 2" x 2" x 3/16" steel angle. Length of angle must be specified at time of ordering.

Model 663 Horizontal Wall Batten

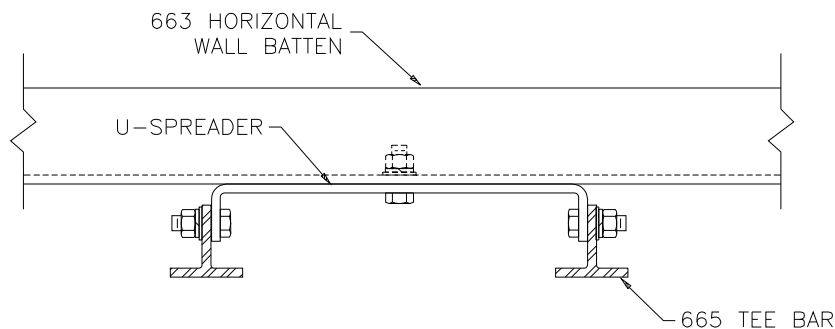
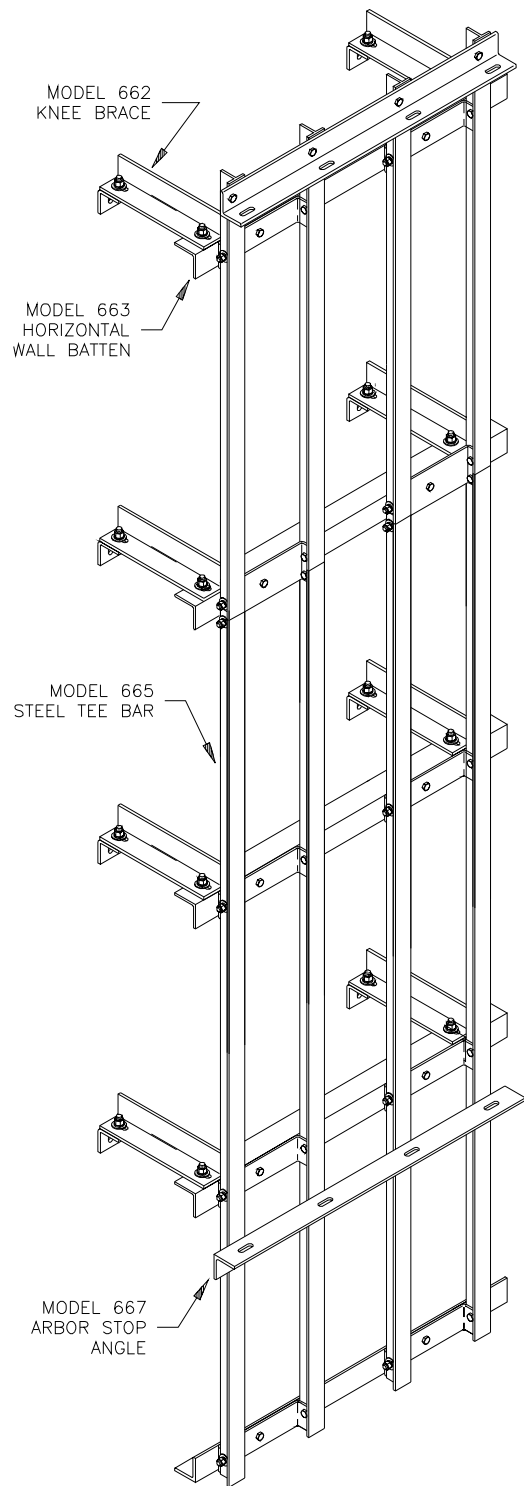
Horizontal wall battens are normally spaced on 5'-0" vertical increments. The 2" x 2" x 3/16" steel angle is punched on the horizontal leg for attachment of knee braces and the vertical leg for attachment of tee bar U-spreader plates. Spacing may be 6", 8", 9", or 12" on center.

Model 665 Steel Tee Bar

Tee bar guides are 1-1/2" x 1-1/2" x 3/16" steel. Splice joints are accomplished at a horizontal wall batten.

Model 667 Arbor Stop Angle

The steel arbor stop angle is mounted at the top and near the bottom of the steel tee bar guides to limit the travel of the counterweight arbors. The 2" x 2" x 1/4" steel angle is bolted to the face of the tee bar. The horizontal leg of the angle is punched for attachment of a hardwood stop (provided by others).



Jay Bar Guide System

Rigid guide systems must be used on applications that exceed 30 feet. This style captures the arbor between aluminum jay bars.

Model 662 Knee Brace

Knee braces are constructed of a two-piece assembly to enable adjustment during installation. Formed 1/4" wall bracket is attached to 2" x 2" x 3/16" steel angle. Length of angle must be specified at time of ordering.

Model 664 Horizontal Wall Batten

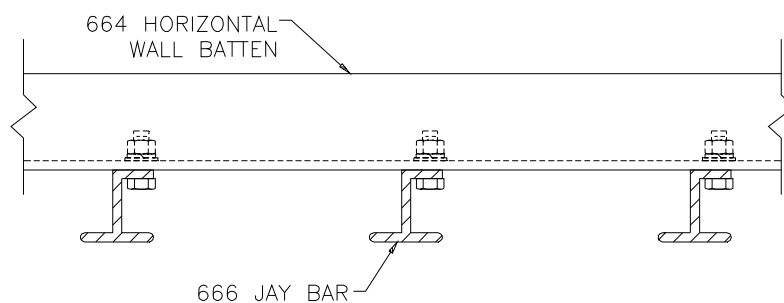
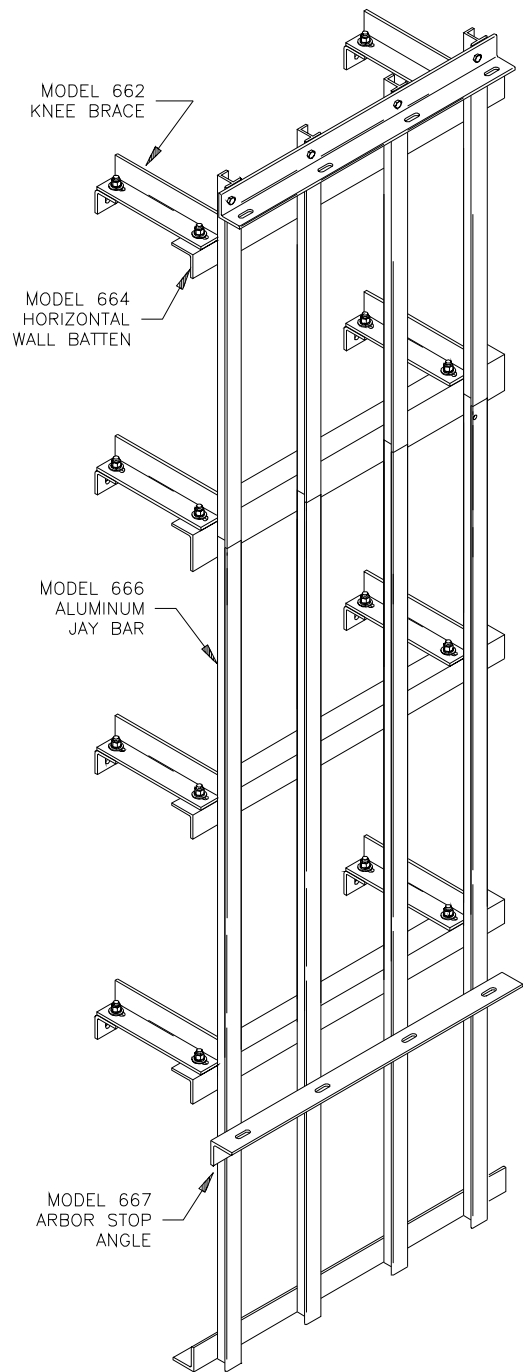
Horizontal wall battens are normally spaced on 5'-0" vertical increments. The 2" x 2" x 3/16" steel angle is punched on the horizontal leg for attachment of knee braces and the vertical leg for attachment of jay bar. Spacing may be 6", 8", 9", or 12" on center.

Model 666 Aluminum Jay Bar

Jay bar guides are 1-1/2" x 1-1/2" x 3/16" aluminum provided in continuous lengths up to 25'-0". Splice joints are accomplished at a horizontal wall batten.

Model 667 Arbor Stop Angle

The steel arbor stop angle is mounted at the top and near the bottom of the aluminum jay bar guides to limit the travel of the counterweight arbors. The 2" x 2" x 1/4" steel angle is bolted to the face of the jay bar. The horizontal leg of the angle is punched for attachment of a hardwood stop (provided by others).





Miscellaneous Rigging Items

Model 660 Lattice Track

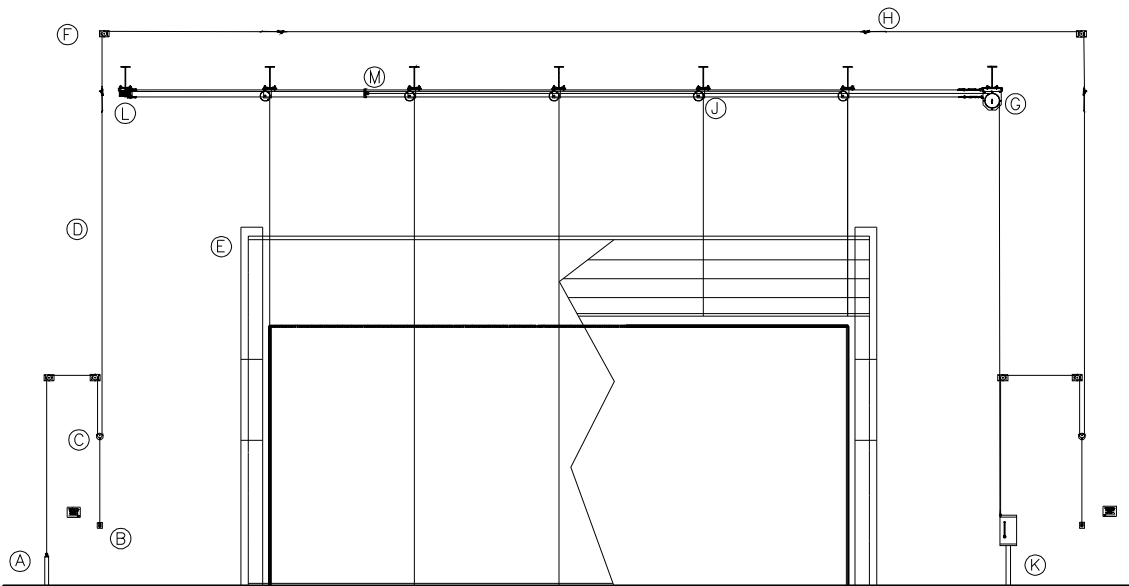
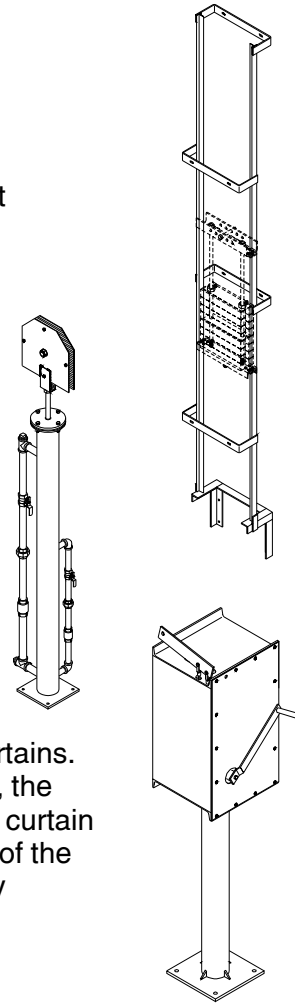
Lattice tracks are most often used with fire safety curtains, act curtains, and paint frames. The arbor assembly is captured and guided between opposing tees of 1-1/2" x 1-1/2" x 3/16" steel. Wall mounting brackets are located 6'-0" on center vertically. Please specify length when ordering.

Model 661 Hydraulic Dash Pot

Dash pots are used to dampen and control the last few feet of downward travel of fire safety curtains. The piston is sized for up to 5'-0" travel (10'-0" of downward curtain travel) and the descent rate is adjustable through a set of calibrated valves. Unit is shipped without oil.

Model 670 Brail Winch with Hydraulic Governor

A brail winch with hydraulic governor is used on brail style (fold-up) fire safety curtains. The safety curtain is stored above the proscenium until needed. When released, the curtain free falls by gravity to cover the proscenium opening. The descent of the curtain is controlled with an adjustable speed governor located inside the winch. Lifting of the safety curtain is accomplished by a manual hand crank. All components are fully guarded within the winch enclosure. Lift capacity is 700 pounds.



- | | |
|-------------------------------------|--------------------------------|
| A - #675 ROUND WEIGHT & GUARD | G - #1230C25 LOFT BLOCK |
| B - #676 RING & PIN STATION W/ SIGN | H - #679 FUSIBLE LINK RELEASE |
| C - #674 4" FLOATING PULLEY | J - #832C25 LOFT BLOCK |
| D - FIRE CURTAIN RELEASE LINE | K - #670 BRAIL WINCH |
| E - SMOKE POCKET | L - #8881C25 MULE BLOCK |
| F - #677 MULE BLOCK | P - #672 HORIZONTAL BRAIL CLEW |

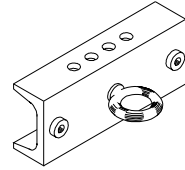
Brail Curtain Schematic

Miscellaneous Rigging Items

Model 672

Horizontal Brail Clew

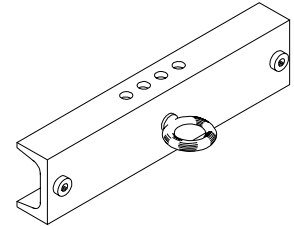
Clews are constructed of heavy steel channel for use with brail fire safety curtain systems with up to eight lift lines. Clew has integral guide bushings sized for 1/4" guide wires on 6-1/4" centers. Guide wires and tie-offs must be provided between mule block and head block assembly. Working load limit 2200 pounds on clew assembly (500 pounds maximum per lift line).



Model 673

Vertical Brail Clew

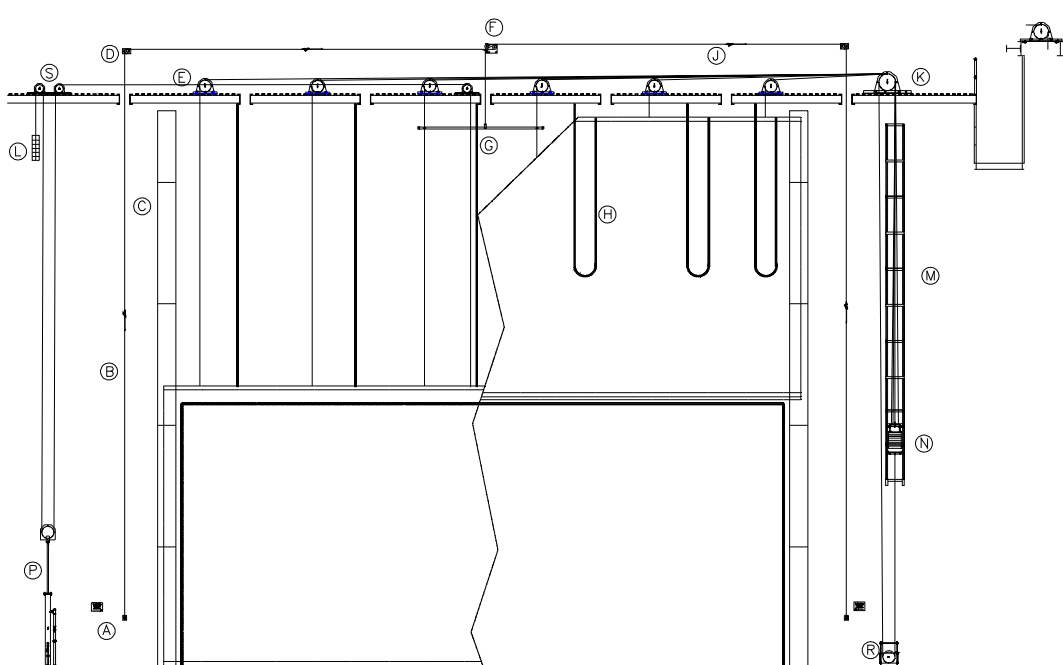
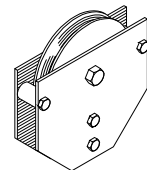
Clews are constructed of heavy steel channel for use with brail fire safety curtains with up to eight lift lines. Clew has integral guide bushings sized for 1/4" guide wires on 11-3/4" centers corresponding to tie-offs on Model 670 Brail Winch. Guide wire tie-offs must be added to head block assembly. Working load limit 2200 pounds on clew assembly (500 pounds maximum per lift line).



Model 674

4" Floating Steel Pulley

These floating style pulleys are used to reeve the fire curtain release line. Sheaves are equipped with sealed precision ball bearings installed in a steel housing. Working load limit 125 pounds.



- A - #676 RING & PIN STATION - WITH SIGN
- B - FIRE CURTAIN RELEASE LINE
- C - SMOKE POCKET
- D - #677 MULE BLOCK
- E - #1240C38 LOFT BLOCK
- F - #681 WEIGHT RELEASE
- G - OVERBALANCE BAR
- H - SAFETY CHAINS

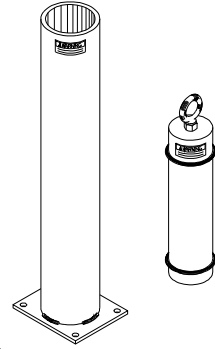
- J - #679 FUSIBLE LINK DEVICE
- K - #71650C38 HEAD BLOCK
- L - LINE WEIGHT
- M - #660 LATTICE TRACK
- N - #993 ARBOR
- P - #661 DASHPOT
- R - #1274C75 FLOOR BLOCK
- S - #840C25 LOFT BLOCK

Safety Curtain Schematic

Miscellaneous Rigging Items

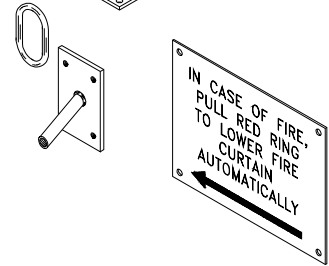
Model 675 Round Weight and Guard

The round weight and guard assembly is designed to maintain tension in the fire curtain release line. The 24 pound weight is guided in an enclosed 2'-0" high tubing guard.



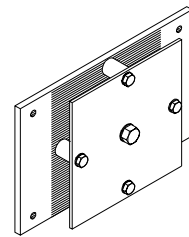
Model 676 Ring & Pin Release with Sign

For manual release of fire curtain release line. Ring is manually removed from pin assembly mounted to wall to lower fire safety curtain. Sign is mounted adjacent to indicate location of release.



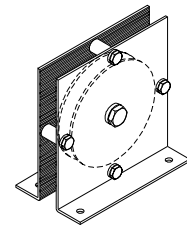
Model 677 4" Steel Mule Block

These blocks are used to reeve the fire curtain release line. Steel sheave is equipped with sealed precision ball bearings installed in a steel housing. Working load limit 125 pounds.



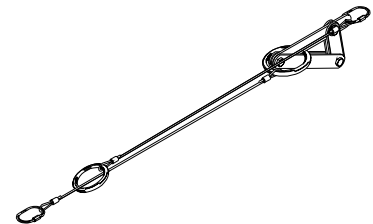
Model 678 4" Steel Stand Up Pulley

These blocks are used to reeve the fire curtain release line. Steel sheave is equipped with sealed precision ball bearings installed in a steel housing. Working load limit 175 pounds.



Model 679 Fusible Link Release

For use in fire curtain release lines. The device captivates the release line so it can be easily reset after separation. Unit is rated at 165°F for loads from 3-30 pounds. Fusible link must be replaced after each separation.



Model 680 Batten Clamp

Formed of 10 gauge steel for snug attachment to 1-1/2" Sch. 40 pipe battens. Two-piece assembly is attached using 3/8" Grade 5 bolts. Top hole is sized for installation of thimble, turnbuckle, or shackle. Working load limit of 1400 pounds based upon straight pull.



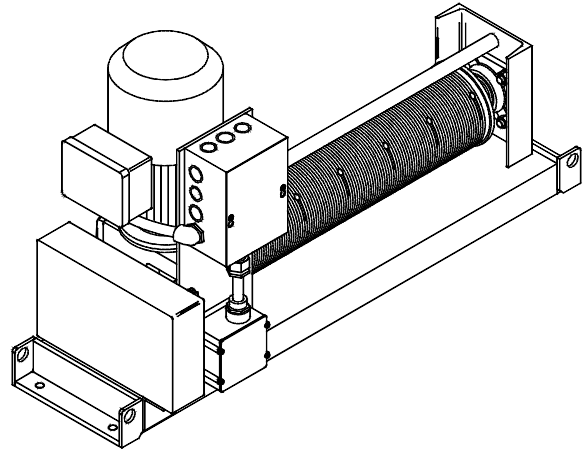
Motorized Winches

Motorized theatrical rigging requires machines designed to meet the specific demands of the entertainment industry. The multiple lifting points common to stage rigging systems dictate the need for a winding drum capable of accommodating long lengths of several cables, wrapping evenly to maintain the level trim of the load.

H & H Specialties brings its extensive experience at precision machining, motor control design, custom panel fabrication and stage rigging to its line of standard theatrical winches.

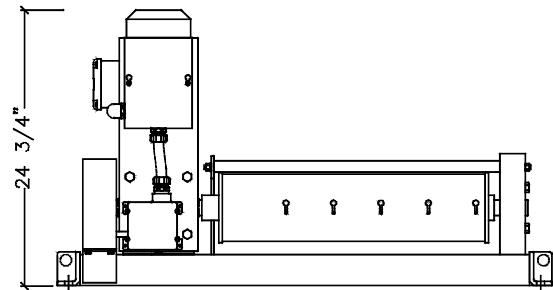
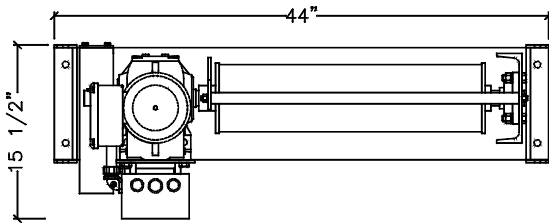
Designed with safety and reliability in mind, each machine is powered by a heavy duty gearmotor with fail-safe brake. Standard controls include primary positioning limit switches with secondary overtravel safety switches. Operating pushbuttons require maintained pressure to run. An emergency stop pushbutton immediately removes power from the winch, sets the brake and stops the load.

These standard winches meet the design parameters of many applications. Contact the factory for information regarding custom modifications.



MODEL NO.	HP	PHASE	VOLTS (60Hz)	F.L.A.
475	1/2	3	230	2.0
476	1	3	230	3.7
477	2	3	230	6.2

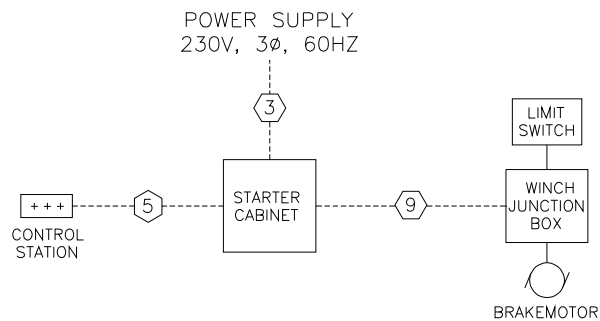
Model No. 476



TYPICAL RISER DIAGRAM

NOTES:

1. DOTTED LINES INDICATE FIELD WIRING.
2. ◻ DESIGNATES NUMBER OF CONDUCTORS REQUIRED (NOT INCLUDING GROUND OR SPARE WIRES)
3. DISCONNECT (IF REQUIRED) PROVIDED BY OTHERS.

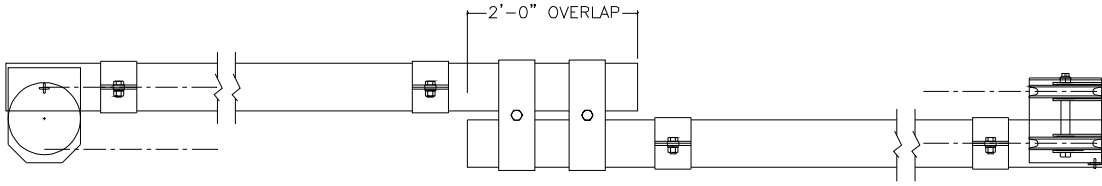


GENERAL SPECIFICATIONS

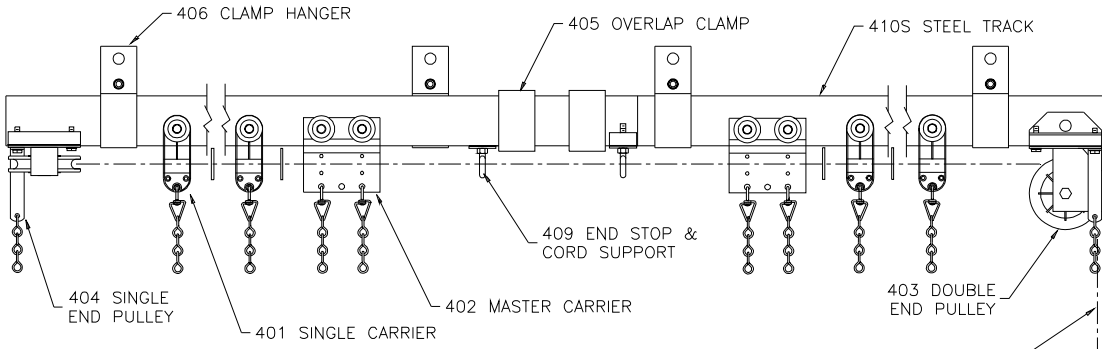
MODEL NO.	HP	CAPACITY lbs	SPEED ft/min	DRUM SIZE	CABLE DIA.	DIMENSIONS			
						Length	Width	Height	Weight
475	1/2	500	19	6" x 24"	3/16"	41"	15"	20"	180 lbs
476	1	1000	20	6" x 24"	3/16"	41"	15.5"	25"	250 lbs
477	2	2000	22	8" x 25"	1/4"	43"	19"	28"	380 lbs



Other Products Manufactured by H & H Specialties Inc.



MODEL 401S - PLAN

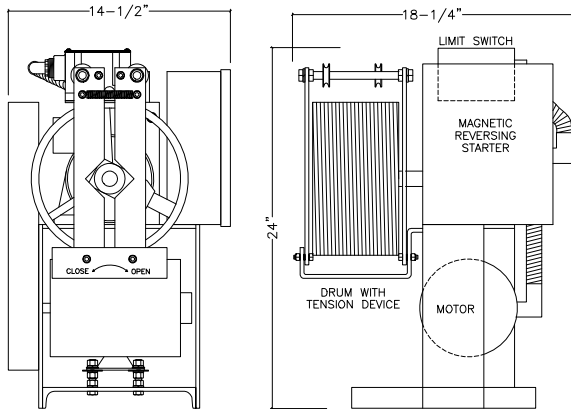


MODEL 401S - ELEVATION

Stage Track

414 OPERATING LINE (3/8")

408 ADJUSTABLE FLOOR BLOCK



Curtain Machines

This catalog is also available on CD-ROM
or on our website: www.hhspecialties.com

Drawings
Specs



Catalogs 10, 11
Manuals

Please consult the factory for information.

For information on products not listed in this
catalog, please contact the factory at:

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ACKNOWLEDGEMENTS

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