Beta Max Portable Hoists

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Chapter 1
Introduction and General Description

Thank you for choosing the Beta Max portable hoist.

The intended purpose of this manual is to inform, guide, and educate the owner/operator on the safe operation and maintenance of the portable hoist. This manual applies to seven models of portable hoists (Beta Lite, Scorpio Plus, Scorpio Plus XL, Gemini Plus, New Yorker, Leo, Leo XXL) and will note model-specific topics where applicable.

All Beta Max hoists meet or exceed ANSI, CSA, OSHA, and UL specifications.

Beta Max, Inc. reserves the right to make design changes at any time, and the information contained in this manual is subject to change without notice. Beta Max, Inc. is not liable for errors in this manual or for any incidental/consequential damages that may result from the use of the material in this manual.

1.1 Description

The Beta Max portable electric utility hoists are general-purpose hoists designed for the construction industry. These hoists are also suitable for other applications that require a compact, lightweight, easy to handle, and efficient hoisting unit. The hoists can be mounted in a variety of ways to serve various applications. Beta Max portable hoists are powered by either a 110V or 220V AC reversible electric motor. Large units may use three-phase power and standard units use single-phase power. Units are NOT field changeable between 110V AC and 220V AC.

A conical brake system is incorporated into the design that will hold the maximum load in place when electrical power is lost or when the load is intentionally suspended or stopped by the operator. The motor is fan cooled and all electrical components are protected from the weather. The gear reduction system is completely enclosed in a die-cast aluminum housing with a sealed lubrication system. Gears and bearings operate in an oil bath. All Beta Max portable hoists have an emergency UP limit switch, which stops the hoist motion when the load has reached the upper limit of travel.

Beta Max portable hoist lifting capacities range from 200 pounds (90 kilograms) to 2000 pounds (907 kilograms), depending on the model. Lifting speeds range from 25 feet per minute (7.6 meters per minute) to 80 feet per minute (24.4 meters per minute). And load lifting heights range from 30 feet (9.1 meters) to 450 feet (137.2 meters). All hoists are factory equipped with rotation-resistant wire rope for load and lifting stability.

Before contacting technical support, please locate and write down the model and serial number for reference. The technician will ask for this information to help resolve the issue in a timely fashion. The model name and serial number are shown on the black and white decal on the control box. The serial number is also stamped on the transmission casting.

DISCLAIMER, PLEASE READ BEFORE CONTINUING: Failure to follow the guidelines in this manual is the sole responsibility of the equipment end user/operator. Beta Max, Inc. is not and will not be held responsible or liable for injury or damages resulting from the end user/operator not following the guidelines set forth in this manual.

1.2 Cautions, Warnings, and Notes

Throughout this manual, the use of WARNINGS, CAUTIONS, and NOTES will be used to identify certain areas, tasks, or conditions that require special attention. WARNINGS and CAUTIONS will always appear directly before the task or issue of concern. **Please read and understand the complete Safety section of this manual before attempting to operate the equipment.**

An example of a WARNING is shown below and will always appear with the same symbol wherever it is used in this manual. A WARNING indicates that personal injury or death could result if the WARNING is not followed.

WARNING

Failure to observe a safety instruction noted by WARNING could result in severe injury or death.

An example of a CAUTION is shown below and will always appear with the same symbol wherever it is used in this manual. A CAUTION indicates that personal injury or equipment damage could result if the CAUTION is not followed.

CAUTION

Failure to observe a safety instruction noted by CAUTION could result in injury or damage to the equipment.

An example of a NOTE is shown below.

NOTE: Used throughout this manual, NOTES provide useful additional data, but are never used to communicate safety hazards.

1.3 Required Repair Tools

The following list of tools will be needed to perform maintenance work on the portable hoist. Many of the tools listed are only required by trained technicians working on the hoist.

1. Metric, long, T-handle-type, Hex Head (Allen) Wrenches:
   - 4-mm, 5-mm, 6-mm
2. Metric sockets and wrenches (6-point and 12-point):
   - 10-mm, 11-mm, 12-mm, 17-mm, 19-mm, 22-mm
3. Standard sockets and wrenches:
   - 7/16-inch, 7/8-inch
4. Flat tip screwdrivers:
   - 1/4-inch, 3/16-inch
5. Phillips head screwdrivers:
   - #1-size and #2-size
6. Retaining snap ring (external) pliers
7. Diagonal cutting pliers
8. Bearing pullers (as needed)
9. Feeler gauge set
10. Wire rope servicing tools
11. Nicopress® Crimping Tools:
    - 1/16-inch, 3/16-inch, and 1/4-inch (or equivalent wire rope terminating tools or clamps)
12. AMP pin and socket removal tools:
    - 9-pin AMP socket removal tool .....#453300-1-0
    - Brake pin removal tool .....#1-305183-1-b
    - Brake socket removal tool .....#1-305183-2
    - Remote cable pin and socket tool .....#1-305173-r
13. Voltmeter

1.4 Understanding Electricity

The electricity that powers your Beta Max hoist is as important as the hoist itself. Electricity may seem complicated, and an easy-to-understand explanation would be helpful. The following is an attempt to help explain and simplify electricity.

Let us compare electricity to water in a way everyone can understand. Electricity is like water passing through a hose or pipe and controlled by a faucet.

The following is a list of terms and their explanations:

- CHARGE is a group of particles gathered together.
- VOLTAGE is CHARGE that flows and builds up pressure. The higher the voltage, the more charges flow.
- AMPERAGE is the measurement of the charge.
- RESISTANCE is restricting or limiting the flow of charge.

In using the example of water in a pipe, the amount of pressure in the pipe is the equivalent to the VOLTAGE. The amount of water flowing through the pipe (volume) can be thought of as the AMPERAGE. And finally, RESISTANCE can be described as the interaction of the faucet (power supply) and the size of the hose (length and gauge of electrical cable).

The measured voltage at the electrical outlet may be 110V AC or 220V AC with nothing plugged in or just a couple of pieces of equipment running. In the context of the water pipe, if the shower is in use, the dishwasher machine is running, and the lawn sprinklers operating, then the pressure (VOLTAGE) will be less for all of the water faucets.

Electrical power in American cities is not always perfect. When a couple of pieces of equipment are plugged into one circuit and drawing a high AMPERAGE, the VOLTAGE will drop. The VOLTAGE (pressure) will not always remain constant, it will decrease. How much the voltage drops depends on the electric power company, specific wiring to the job site, and the length and type of extension power cable (hose size) being used.

What about the faucet (RESISTANCE)? If the faucet is rusted, corroded, undersized, or located a long distance from the source, the water pressure (VOLTAGE) will not be as strong as desired. Likewise, with electricity, if the electrical connections are corroded, the electrical extension cable is undersized or too long, or any combination of these circumstances exist, then the VOLTAGE at the hoist may be too low to lift the load, and the hoist could become damaged.

Beta Max electrical hoists are high energy and can lift large loads at high speeds which requires a lot of AMPERAGE (water volume). Therefore, a lot of continuous VOLTAGE (pressure) is required. As the load increases, more AMPERAGE is needed. Beta Max hoists require more AMPERAGE than a simple rotary saw or drill because of the extra work being performed.

NOTE: Beta Max portable hoists require 20 to 30 amperes for the 110V AC models and 10 to 20 amperes for the 220V AC models.

Connectors

Beta Max hoists are supplied with interlocking plugs because they are safer and more efficient conductors of electrical current. The hoists are also fitted with 20-ampere or 30-ampere service due to the higher energy (amperage) requirements. Beta Max suggests no less than 10 gauge (10/3 S.O.) for 110V AC models and 12 gauge (12/3) for 220V AC models. Heavier electrical cable is required for Beta Max hoists and will allow a longer distance between the power source and hoist without causing an excessive resistance to the current flow. A result of an increase in resistance is the buildup of heat.

Voltage

There is a distinct difference between 110V AC power and 220V AC power. An electric motor wired for 110V AC will not run if connected to a 220V AC circuit and vice versa. This is true of all Beta Max portable hoists. Electric motors wired for 220V AC have the advantage over 110V AC motors because they can use longer extension cords due to less resistance. An added benefit for 220V AC motors is they require less AMPERAGE to operate and, as a result, are able to run cooler and longer than 110V AC models.

CAUTION

Using excessively long electrical cable and/or incorrect wire gauge size will generate high resistance, heat, and the potential for a fire hazard. Use only the correct length and gauge as recommended by Beta Max.

Electrical Cables/Strain Reliefs

Electrical cables, whether hanging from a height or stretched out along a flat surface, will have strain. Strain will damage the cable by either pulling apart the connectors or separating the wires inside. A strain relief is a securing device on an electrical cable that allows the cable to move freely without separating it from the connector or power supply. The strain relief allows flexibility in the cable without putting stress on attachment points. Beta Max strongly recommends the use of strain relief devices on the electrical cables to protect the hoist, connectors, and power supply from damage.

NOTE: Beta Max requires a 50 percent duty cycle for portable hoists. This means the hoist should be in continuous operation for only 20 minutes out of every 40 minutes.

WARNING

Failure to observe a safety instruction noted by WARNING could result in severe injury or death. Ensure all supporting structures and load-attaching devices used in conjunction with this equipment provide an adequate safety factor to handle the rated load plus the weight of the equipment. Consult the Scaffold Industry Association (SIA) for guidance in safely erecting the scaffold. If in doubt, consult a qualified structural engineer. This equipment is not to be used for lifting, supporting, or transporting people or lifting or supporting loads directly over the top of people. Beta Max, Inc. assumes no responsibility for the incorrect or unsafe use of this equipment.

WARNING

This hoist is not designed for lifting or transporting people. This hoist is intended to be used for the sole purpose of lifting or lowering materials and equipment directly between the ground and a roof, intermediate floor, or scaffold. The hoist should be used only on flat, level roofs or masonry floors. When mounting to scaffold, the scaffold must be erected to OSHA and ANSI standards. Any other use of this equipment voids the manufacturer's warranty and is the sole responsibility of the owner/ user, should any damage or injury occur.

Chapter 2
Safety

This chapter contains safety guidelines for operating the Beta Max portable hoist. It describes safety instructions included throughout this manual, lists safety precautions to follow when operating or working on the machinery, and describes machine safety devices.

This chapter contains the following sections:

2.1 Safety Responsibilities

This chapter contains information that must be followed to ensure personal safety, as well as safe operation and maintenance of the Beta Max portable hoist. Any modification of this machine in any way may result in damage to the machinery or injury to personnel. Beta Max, Inc. is not and will not be responsible or liable for any incident or injury resulting from negligence, equipment modification, or failure to follow the safety guidelines.

Operators and maintenance personnel must use the following safety guidelines and procedures before either operating or working on the Beta Max portable hoist.

- Read and understand the contents of this manual before trying to operate the equipment.
- Be familiar with all safety procedures and safety devices.
- Know the locations of all emergency stop push buttons or power disconnects.
- Observe all safety precautions.
- Always disconnect the power supply before attempting any repair or maintenance.
- Take up slack in wire rope slowly.
- If hoist is mounted with an optional Roller Top or I-Beam Trolley Top mounting system, move or slide the hoist slowly to prevent load shifting and moving.
- Pull slack wire rope off the drum when in the down direction.
- Perform a daily visual inspection for any signs of obvious equipment damage and, if found, correct the area(s) before attempting operation of the hoist.

2.2 Safety Instructions

Safety instructions are noted throughout this manual. Each safety instruction is given as a WARNING or a CAUTION, and is accompanied by a safety symbol in the left-hand margin as shown below:

WARNING

Failure to observe a safety instruction noted by WARNING could result in severe injury or death.

CAUTION

Failure to observe a safety instruction noted by CAUTION could result in injury or damage to the equipment.

NOTE: Used throughout this manual, NOTES provide useful additional data, but are never used to communicate safety hazards.

The Attention symbol shows a general safety instruction that is not related to a specific safety point. Pay attention to WARNING, and CAUTION notices wherever you see this symbol.

The Pinch Point symbol shows that moving parts are a potential hazard. Reaching into equipment or wearing loose clothing near a pinch point can cause fingers to be crushed.

The Voltage symbol shows that electrical components are a potential hazard. Touching or even getting near electrical components while they are energized can result in serious injury or death. Always ensure electrical components are disconnected before performing any maintenance or repair.

2.3 Safety Precautions

Safety must be of foremost importance to everyone. Injury to personnel or damage to equipment is possible if safety procedures are not followed. The safety issues described in this chapter are the responsibility of operators and maintenance personnel at all times. Obey the following general safety precautions when operating or working on the equipment.

.General

- Use caution when handling the Beta Max portable hoist during installation. There are components that may be damaged or broken if the hoist is dropped or handled roughly. Never attempt to lift the hoist by using the control box as a handhold. It is not designed to support the weight of the hoist and will break off. Beta Max, Inc. will not be held liable for any accident or damage caused during installation by the customer.
- Know the location and operation of the emergency stop push button or power disconnects before operating the Beta Max portable hoist.
- Never place hands within any area of the wire rope or pulleys while wire rope is in motion.
- Only authorized and trained personnel should perform electrical repair work.
- Ensure no people are directly below or within 20 feet of hoist while operating.
- Keep operating area clear of clutter to prevent falling/tripping over obstacles.
- Inspect system daily to ensure bolts and anchoring devices are secure and tight.
- Disconnect power from hoist before attempting any electrical repairs.
- Never submerge electrical power cords or pendant in water or any other liquids.
- The hoist is not designed to lift people and should never be used for that purpose.
- Do not exceed maximum lifting capacities stated on the hoist model and serial number label/plate.
- Wear heavy gloves at all times when handling the wire rope.
- Locate, read, and understand all warning/safety/capacity labels on the hoist.
- Keep hands and fingers away from drum when hoist is operating.

Pinch Points

- Keep hands and other body parts away from moving equipment. Pinch points present danger of injury or mutilation where moving equipment parts come together. Any moving part is a possible pinch point.

Electrical Shock

- Use caution when working on the electrical control box or any termination boxes. The control box presents danger of very high voltage and risk of electrical shock. Only authorized and trained electricians should open the control box and work with the components inside.

Eye Protection

- Wear eye protection at all times while working on or near the equipment.

WARNING

This hoist is not designed for lifting or transporting people. This hoist is intended to be used for the sole purpose of lifting or lowering materials and equipment directly between the ground and a roof, intermediate floor, or scaffold. The hoist should only be used on flat, level roofs or masonry floors. When mounting to scaffold, the scaffold must be erected to OSHA and ANSI standards. Any other use of this equipment voids the manufacturer warranty and is the sole responsibility of the owner/ user, should any damage or injury occur.

WARNING

Ensure all supporting structures and load-attaching devices used in conjunction with this equipment provide an adequate safety factor to handle the rated load plus the weight of the equipment. Consult the Scaffold Industry Association (SIA) for guidance in safely erecting the scaffold. If in doubt, consult a qualified structural engineer. This equipment is not to be used for lifting, supporting, or transporting people or lifting or supporting loads directly over the top of people. Beta Max, Inc. assumes no responsibility for the incorrect or unsafe use of this equipment.

NOTE: These two warnings, or a facsimile thereof, also appear on the hoist in the form of a label for reference and should not, under any circumstance, be removed from the equipment.

2.4 Personal Safety Equipment

Operator personal safety equipment is an important item for safe operation of any equipment. The following is a list of minimum required personal safety equipment for safe use of the Beta Max hoist. There may be other required safety equipment not contained in this list. Please refer to other source material, such as the Occupational Safety and Health Standards (OSHA) manual, the American National Standards Institute (ANSI) manual, and all local/national safety regulations of the country where the equipment is being installed.

Minimum required personal safety equipment

- Safety helmet
- Steel-toed work shoes/boots
- Heavy work gloves
- Safety glasses

NOTE: Failure to follow these guidelines is the sole responsibility of the equipment end user/operator. Beta Max, Inc. is not and will not be held responsible or liable for injury or damages resulting from the end user/operator not following the guidelines set forth in this manual.

2.5 Operator Safety Precautions

Safe operation of the Beta Max hoist requires the operator to avoid certain actions and/or conditions. Below is a list of items that must be followed for the safety of the operator, equipment, and any people near the work site.

DO NOT use the emergency UP limit switch to stop upward motion of the hoist.

DO NOT use or operate the hoist if the hoist is damaged or not working properly.

DO NOT use or operate the hoist if the UP limit switch is not working properly.

DO NOT use or operate the hoist if wire rope is twisted or damaged.

DO NOT use the hoist to lift people.

DO NOT use the hoist for side lifting/loading.

DO NOT use the hoist remote control if you cannot see the hoist.

DO NOT use the hoist remote control if you are not in direct communication with someone who is monitoring the hoist.

DO NOT swing the load or hook when moving the hoist.

DO NOT overload the hoist with the static load or by suddenly jolting the load.

DO NOT leave a suspended load unattended.

DO NOT lower the hook to the extreme end of the cable. Always maintain three wraps of wire rope on drum.

DO NOT transport loads above people.

DO NOT allow people to stand under a loaded hoist.

DO NOT exceed the recommended duty cycle of the hoist.

DO NOT exceed the fuse rating recommended by the National Electric Code.

DO NOT change the wiring leads of the UP limit switch or pendant push buttons.

2.6 Safety Checklist

General

☐ Lift meets all local safety and electrical regulations.

☐ Operator has read and completely understands this manual.

☐ Operator fully understands the operation and use of the hoist.

☐ Operator is not tired or under stress.

☐ Operator is not under the influence of medicine, drugs, or alcohol.

☐ Operator is not alone while operating the hoist.

☐ Operator is wearing the appropriate safety clothing and equipment.

☐ Hoist identification labels, tags, and plates are not modified in any way or missing.

☐ Work area near and around hoist is free from obstructions, clutter, and trip hazards.

Wire Rope, Hooks, and Clasps

☐ Wire rope is not old, twisted, nicked, gouged, kinked, bent, corroded, frayed, knotted, or otherwise damaged. If it is, replace the wire rope.

☐ Wire rope is evenly and smoothly wound onto the drums.

☐ A minimum of three wraps of wire rope are on drum at all times.

☐ Hooks and clasps are not deformed, cracked, or pulling apart.

☐ Hook spring catch is properly installed and not bent or damaged.

☐ Wire rope ends are properly terminated and secured.

☐ Wire rope has adequate surface lubrication and is not dry to the touch.

Electrical Power Source and Cables

☐ Voltage from power source is clean, correct, and properly grounded. Reference hoist labels for correct voltage.

☐ Voltage from power source should not vary by more than 10 percent when the hoist motor is lifting a load.

☐ Verify correct operation of the emergency UP limit switch.

☐ UP limit switch bar must show no sign of damage.

☐ Electrical cable between the power source and hoist should not exceed 100 feet (30.5 meters) in length unless the optional Booster Transformer is being used.

☐ Electrical power supply cable between the power source and hoist is a minimum size of #10 gauge wire. Use of a lighter-gauge wire is unacceptable, and use of a heavier gauge is recommended.

☐ Electrical 30-amp interlocking connectors of the proper specification.

☐ Control pendant is not cracked or damaged.

☐ Control pendant raise/lower buttons are not sticking and work freely.

☐ Control pendant emergency stop button is operating correctly.

Scaffold

☐ All fasteners/fittings are tight and secure.

☐ Structural surface shows no sign of corrosion.

☐ Scaffold is properly and securely braced.

☐ Scaffold is properly balanced with correct amount of counterweight/ballast.

☐ Scaffold is level in all directions and vertical (not leaning).

2.7 Safety Labels

Safety labels indicate special hazards in and around the Beta Max portable hoist work area. Read all safety labels and follow instructions on them.

Below are some examples of safety labels you may observe while working on the Beta Max portable hoist:

Figure 2.1

Example of safety labels

Chapter 3
Components

This chapter will cover the major components of the Beta Max portable hoists. Each model of hoist has the same major components but may vary slightly in appearance. The five areas discussed are: Motor/Brake, Transmission/Drum, Wire Rope, Shroud and Tops, and Control Box.

3.1 Motor and Brake

Beta Max portable hoists are powered with either a 110V AC electric motor or a 220V AC, single- or three-phase, electric motor, depending on the model and customer choice. The motor is fan cooled and all electrical components are sealed and protected from the weather.

A fail-safe, conical braking system provides safe load handling at any lifting position and securely holds the load even when electrical power is lost. This system operates from the inductive forces in the rotor created by the AC current through the stator wires.

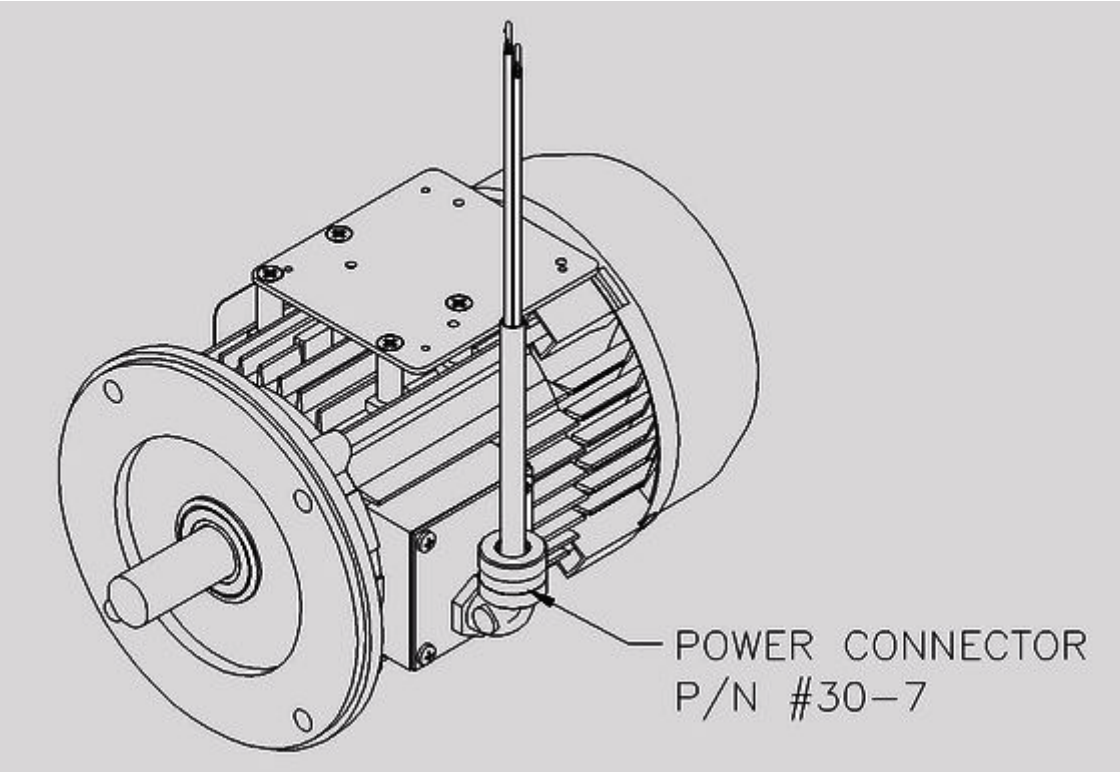


Figure 3.1

Motor and Brake

3.2 Transmission and Drum

The gear reduction assembly for the transmission is maintenance-free and permanently lubricated. It should be inspected monthly for leaks or damage and should be inspected by a factory service center after the first year of use. The gear reduction system is completely enclosed in a die-cast aluminum housing with a sealed lubrication system. Gears and bearings operate in a grease bath.

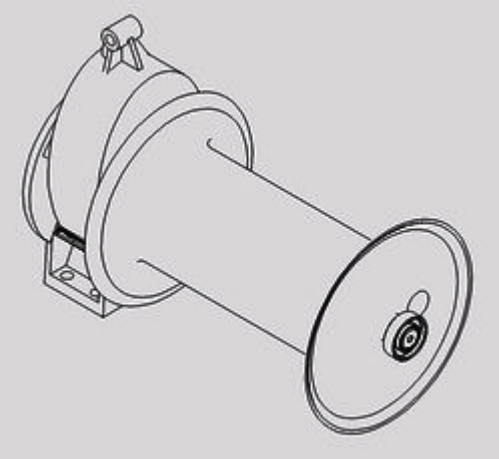


Figure 3.2

Transmission and Drum

3.3 Wire Rope

The most important component of the hoist is the wire rope. It should be carefully monitored and checked during use, and after extended periods of storage. Always ensure the wire rope is lubricated. Do not allow the rope to be bent sharply, pinched, tied in a knot, or otherwise damaged.

Most Beta Max portable hoists have single-wire rope rigging. However, there are some models that can be purchased, or fitted, for double-rope rigging. (Only Beta Lite, Gemini Plus, Leo, and Leo XXL models can be double-rope rigged.) The advantage of double-rope rigging is the ability to lift twice the weight of single rigging. The disadvantages are a reduction of the lifting height and rate of lifting (speed) by one-half. Double-rope rigging requires an 8-inch (20.3-centimeter) sheave and pulley, another hook, and a shackle. Typically, the hoist wire rope is terminated with a weight (headache ball) and thimble.

CAUTION

When using a double-wire rope rigging setup, be certain the mounting/support system is rated for the increased weight that double-rope rigging will allow. Double-rope pulley presents a potential pinch point. Keep hands and fingers away from moving parts.

Important User Information Required for Safely Using Wire Rope and Wire Rope Slings

Before using wire rope, it is important to know and understand some information concerning the safe use of wire rope and wire rope slings. The following information is an overview and is not a complete discussion. Key terms, conditions or situations to avoid, and inspection criteria will be discussed. The intended purpose of this information is to inform the end user of wire rope or wire rope sling usage and is not intended to be all-inclusive. Please consult other sources for more in-depth information. **ISO 4309:2004 details wire rope in-service guidelines for the care, maintenance, installation, examination, and discard criteria for safe use of the hoist.**

NOTE: Failure to follow these guidelines is the sole responsibility of the equipment end user/operator. Beta Max, Inc. is not and will not be held responsible or liable for injury or damages resulting from the end user/operator not following the guidelines set forth in this manual.

Nominal Strength (or Catalog Strength)

- This number, supplied by the wire rope manufacturer, refers to a controlled environment, straight-line pull test on a new, unused wire rope. The rope is actually pulled until it breaks and this value is called nominal strength. Since nominal strength is the point of failure, **never use this value as an indicator of the maximum working load capacity of the rope. This is not the maximum working load capacity. Maximum working load capacity must be calculated before work is started!**

Design Factor (or Safety Factor)

- The working load of a wire rope must be calculated by a using a design factor. This number will be much less than the given nominal strength to provide a margin of safe operation. The design factor will vary depending upon the type of machine, work load, and installation. The end user/operator must determine the applicable design factor before operating the hoist for safe operation.

NOTE: **Beta Max hoists require a 5:1 safety factor with regard to wire rope.**

WARNING

No wire rope or wire rope sling should ever be installed or used without full knowledge, consideration, and application of the design factor for the intended use. Failure to comply may result in equipment damage, bodily injury, or possible death.

- Design factors have been established by the Occupational Safety and Health Administration (OSHA), the American National Standards Institute (ANSI), the American Society of Mechanical Engineers (ASME), and similar government and industrial organizations. Please consult one of these sources to determine the correct design factor for the work being performed.

Maximum Working Load Capacity

- Determining the maximum working load capacity is not difficult. Once the design factor is determined, simply divide the nominal strength (provided by the wire rope manufacturer) by the design factor. In this example, 5540 pounds (2512.9 kilograms) will be used as the nominal strength, and 5 will be used for the design factor. Simply divide 5540 by 5 and the answer is 1108 pounds (502.6 kilograms). Thus, 1108 pounds (502.6 kilograms) is the maximum, safe load capacity to be applied to the rope system.
- Every wire rope user should be aware of the fact that each type of fitting attached to a wire rope has a specific efficiency rating which can reduce the working load of the rope assembly or rope system, and this must be given due consideration in determining the capacity of a wire rope system.

Conditions or Situations to Avoid

With use, all wire ropes will wear out. The strength of a wire rope begins to decrease when the rope is put in use and continues to decrease with each use. Severe abuse and/or misuse of the wire rope will shorten its useful life, and eventually the rope will need to be replaced. Wire rope will fail under the following conditions: using the rope beyond its normal life, overloading, misusing, damaging, or improperly maintaining.

- **Never** exceed the lifting capacity of the wire rope. This means never use the rope where the load applied to it is greater than the working load determined by dividing the nominal strength of the rope by the appropriate design factor.
- **Never** shock load a wire rope. Shock loading can be explained as a sudden application of force or load to the rope such as jerking or suddenly releasing the load. This action can cause both visible external damage and unseen internal damage. There is no practical way to estimate the forces involved by shock loading a rope.
- **Never** use a rope that is dry and lacking lubricant. Lubricant, applied to the wires and strands when manufactured, will become depleted as the rope is used. Periodic lubrication of the wire rope is essential to maintain the life of the rope.

Inspection

Regular, periodic wire rope inspections and maintenance of permanent records (signed by a qualified person) are an OSHA requirement for almost every wire rope installation. The purpose of inspection is to determine if a wire rope, or wire rope sling, may continue to be safely used. Inspection criteria, including number and location of broken wires, wear and elongation, etc., have been established by OSHA, ANSI, ASME, and similar organizations. Refer to these sources for detailed information on proper inspection and documentation procedures.

⚠ WARNING

If the usability or integrity of the wire rope is ever in question, replace the wire rope immediately to avoid possible personal injury or potential equipment damage.

NOTE: When a wire rope is removed from service, because it is no longer suitable for use, it must be discarded and never reused on any application.

A typical daily wire rope inspection should consist of at least the following items:

- Visually inspect for obvious normal and unusual surface wear.
- Visually inspect for broken wires; document the amount and location.
- Measure the wire rope outside diameter; document and compare to original size.
- Measure the wire rope length for stretch (elongation). Document and compare it to original size.
- Visually inspect wire rope attachment ends for obvious damage or corrosion.
- Visually inspect wire rope for any signs of abuse, surface corrosion, or contact with another object.
- Inspect wire rope for any signs of damage due to heat.
- Generally inspect the condition of any components that make contact with the wire rope such as sheaves, drums, or any other attachment.

Conditions Leading to Wire Rope Damage

- Undersized, worn, or corrugated sheaves cause damage to a wire rope.
- Broken wires indicate a loss of strength and integrity.
- Kinks permanently damage a wire rope and must be avoided.
- Knots permanently damage wire ropes.

WARNING

Never use a rope that has become knotted. It is unusable at this point and should be discarded.

- Environmental factors, such as corrosive conditions and heat, can damage a wire rope.
- Lack of lubrication can significantly shorten the useful service life of a wire rope.

Contact with electrical wires, high voltage, and arcing will damage a wire rope.

WARNING

Never use a portable hoist near any exposed, bare electrical wiring. The potential for electrocution is extreme and this condition should be avoided at all costs.

WARNING

Always replace wire rope with the same diameter and strength specifications of the original wire rope supplied with the hoist. Never replace wire rope with any different specifications without first contacting and consulting the dealer or Beta Max, Inc. If wire rope specifications are not known, contact Beta Max, Inc. with the proper model and serial number to verify correct wire rope specifications for the intended application and model.

3.4 Shrouds and Mounting Tops

Shrouds

The shrouds are steel housings that cover and protect the motor, drum, brake, transmission, and wire rope. Attached to the shrouds are caution labels, decals, and identification plates containing information for the hoist. **Please read and follow all information provided on the shroud labels and identification plates before operating the hoist for important safety and cautionary information.** The identification plates indicate the model numbers, serial number, voltage, motor horsepower, maximum weight capacity, and maximum lift height capacity. The toll-free Beta Max, Inc. telephone number is also located on the shroud. Before calling, please have the model and serial number written down for quick reference.

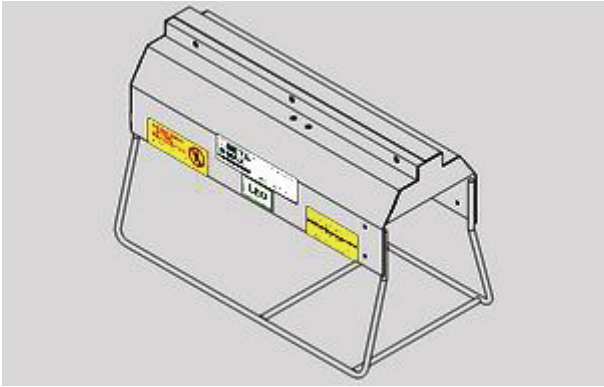


Figure 3.3

Shroud

Mounting Tops

Mounting tops bolt to the top of the hoist shroud and support the hoist. Two styles allow the hoist to be rolled back and forth. The three available mounting top styles are: Fixed I-Beam Top, Rolling I-Beam Trolley Top, and Roller Top. The Fixed I-Beam mounting top is simply bolted to the I-Beam and keeps the hoist in a set position. The Rolling I-Beam Trolley Top mounts to an existing I-Beam and has rollers to allow free movement of the hoist along the I-Beam being used. The Roller Top is designed to roll along channel iron, either on top of a single piece of channel iron or between two pieces of channel iron.

NOTE: Rolling I-Beam Trolley Top and Roller Top come supplied with a hoist stop pin and keeper for installation. The stop pin prevents the hoist from rolling off the end of the I-Beam or channel iron.

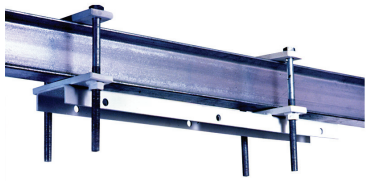


Figure 3.4

Fixed I-Beam Top

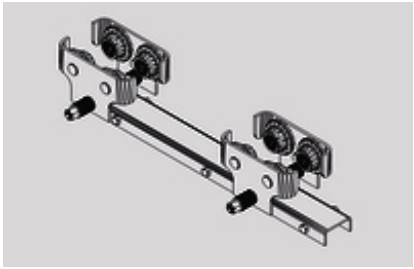


Figure 3.5

Rolling I-Beam Trolley Top

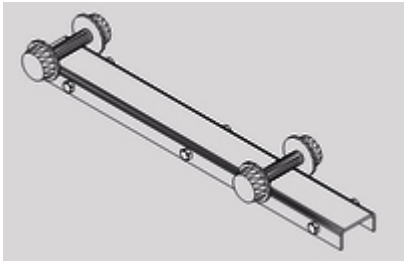


Figure 3.6

Roller Top

NOTE: Always handle the hoist with care when transporting and mounting to avoid equipment damage. Do not allow any part of the hoist to be battered against other objects. Only use the handles to carry the hoist and never use the UP limit bar, power cable, or pendant cable to lift the hoist.

3.5 Hoist Mounting Options

Beta Max, Inc. offers several portable hoist mounting options depending on the model being used and the particular work being performed. The six available options are: Vertical Post, Sliding Trolley, Scaff-Trac, Mac-Trac, Trestle Monorail, and I-Beam. Provided below is a table showing the different models and what type mounting option is available.

Table 3.1

Model	Vertical Post	Sliding Trolley	Scaff-Trac	Mac-Trac	Trestle Monorail	I-Beam
Beta Lite	Yes	Yes	No	No	No	No
Scorpio Plus	Yes	No	Yes	Yes	Yes	Yes
Scorpio Plus XL	Yes	No	Yes	Yes	Yes	Yes
Gemini Plus	No	No	Yes	No	Yes	Yes
New Yorker	No	No	Yes	No	Yes	Yes
Leo	No	No	Yes	No	Yes	Yes
Leo XXL	No	No	Yes	No	Yes	Yes

Vertical Post

This type of mounting is used for the smaller, lightweight hoists and allows quick installation on existing pipe scaffold. Clamps and bolts securely and easily hold the hoist in place. The pivot mount allows 180-degree movement for maximum flexibility of load movement. Vertical post mounts can be either top or bottom supported. For use on Beta Lite, Scorpio Plus, and Scorpio Plus XXL only.

NOTE: This type mounting is approved for use on masonry walls only.

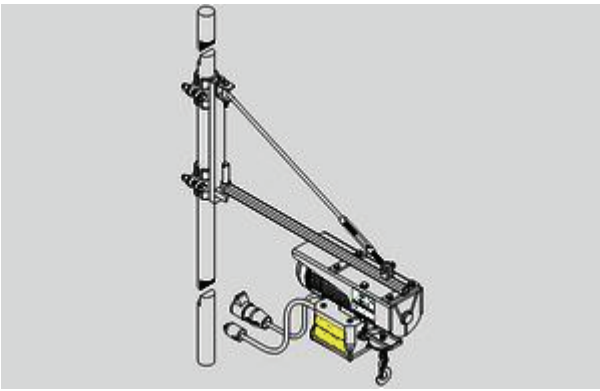


Figure 3.7

Vertical Post Shown with Beta Lite Hoist

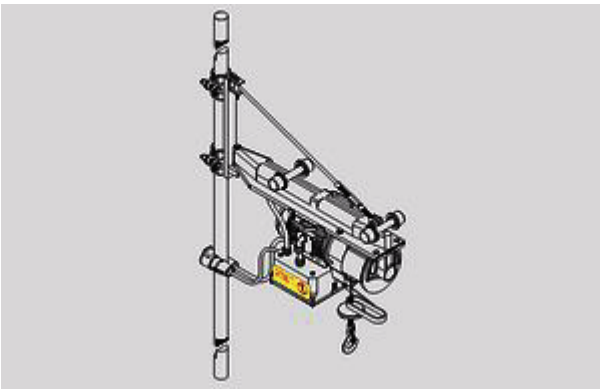


Figure 3.8

Vertical Post Shown with Scorpio Plus Hoist

Sliding Trolley

A variation of the Vertical Post mount, the Sliding Trolley, adds a five-foot (1.5-meter) cantilever with a sliding trolley for more flexibility in material handling.

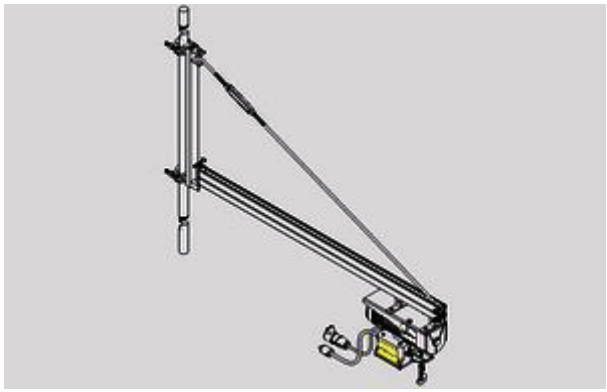


Figure 3.9

Sliding Trolley Shown with Beta Lite Hoist

Scaff-Trac

This hoist suspension system allows easy, tool-free mounting of Beta Max portable hoists to existing job site scaffold. Scaff-Trac is designed for use on standard 6-foot walk-through, tubular scaffold frames with 7-foot (2.1-meter) center spacing. The basic section total length is 11 feet (3.4 meters) including a 3.5-foot (1.1-meter) cantilever (overhang) at the end for hoist mounting. An optional version of Scaff-Trac is available for use with 8-foot (2.4-meter) cross braces and has a 2.5-foot (0.8-meter) cantilever.

The Scaff-Trac monorail is attached to the scaffold with two saddles, safety pins, and keepers that fit on top of the scaffold tubular frame. Special square saddles are available for mounting on nonstop adjustable scaffold. In addition, 7-foot (2.1-meter) and 8-foot (2.4-meter) extensions are available. The Scaff-Trac system can be used on all Beta Max portable hoists **except** the Beta Lite model.

NOTE: Scaffold frames should always be securely pinned together, anchored to the building face, and counterbalanced appropriately. Check the Scaffold Industry Association guidelines for more details.

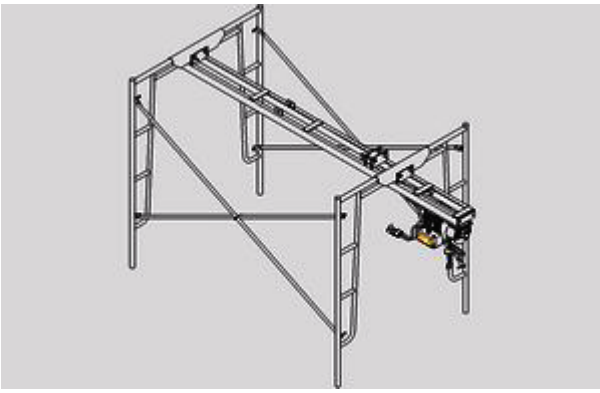


Figure 3.10

Scaff-Trac

Mac-Trac

For use **only** with the Scorpio Plus and Scorpio Plus XXL models, Mac-Trac is designed for masons and chimney builders. Mac-Trac mounts to existing 4-, 5-, or 6-foot (1.2-, 1.5-, 1.8-meter) standard 1-5/8 inch- (0.3175-centimeter-) tubular scaffold frames. The system is set for a 7-foot (2.1-meter) cross brace and the Trac cantilevers 2 feet (0.61 meter) out over the cross brace side of the scaffold tower. By removing the scaffold cross brace at the work level and ensuring the cross brace is properly installed on the frame above (use alternate horizontal brace at the level where cross brace has been removed), the workload can be pulled in by hand and set down on a work platform. For lifting larger loads, the system can be adjusted to raise material up through the center of the scaffold to the work platform.

The Mac-Trac system consists of two supports and the Trac monorail. Two identical horizontal supports span the 7-foot (2.1-meter) scaffold frame and set down on the scaffold coupling pins. Gravity lock pins fasten the horizontal supports to the coupling pins, and J-hook clamps secure the supports around the top horizontal ledger of the scaffold.

The Trac monorail is a formed channel specifically made to accept the roller wheels of the Scorpio hoist models. The Trac is slotted at the open end to make it easy to slide the hoist into the Trac. Safety pins and keepers prevent the hoist from rolling out of the Trac. The hoist and Trac can be positioned in the center, left, or right of the 7-foot (2.1-meter) scaffold span by choosing the appropriate mounting holes on the horizontal supports.

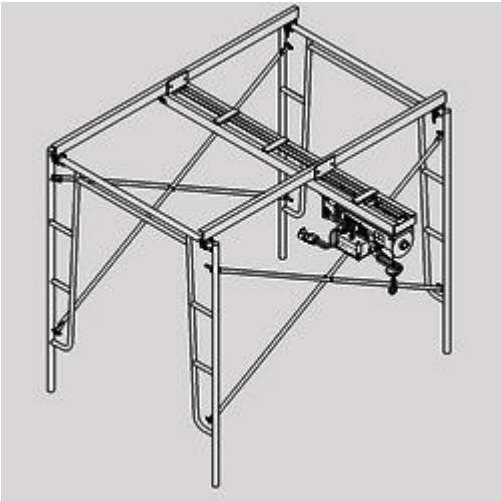


Figure 3.11

Mac-Trac

Trestle Monorail

Designed for use on a flat rooftop or between floors of a building, this heavy-duty system accepts all Beta Max portable hoists **except** the Beta Lite model. The system consists of a monorail Trac, uprights, braces, brackets, mounting pins and keepers, and a 3.5-foot (1.1-meter) cantilever. The Trestle Monorail must be anchored in one of the following four ways for safe hoist operation: trestle ceiling brace, floor tie-down clamps, ballast containers, or counterweight clamps. *(See next section for details.)*

WARNING

Trestle Monorail systems require the use of tie-back ropes in addition to the anchoring method chosen to secure the structure. Anchoring of the Trestle monorail without using tie-back ropes is not acceptable. Beta Max, Inc. will not be held responsible for injury resulting from the operator/ end user not following this warning.

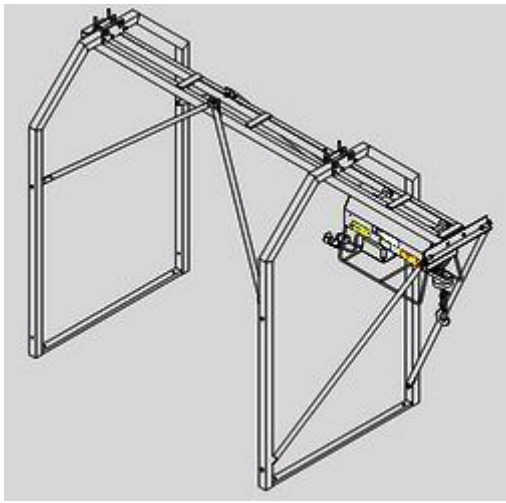


Figure 3.12

Trestle Monorail

3.6 Methods of Anchoring the Trestle Monorail

Trestle Monorail Ceiling Brace

Use this method when the Trestle Monorail will be installed on an intermediate floor of a building with a rigid structural ceiling above. After the Trestle Monorail is assembled and placed in the desired location, a jack is bolted to the top of the inboard (rear) end of the Trestle Monorail. The jack is extended until it makes firm contact with the ceiling. This locks the Trestle Monorail between the ceiling and the floor and stabilizes the system.

Floor Tie-Down Clamps

For a more permanent application, anchor bolts are secured to the floor near the base of the inboard (rear) end of the Trestle Monorail uprights. Either Beta Max floor tie-down clamps, a heavy chain, or equivalent is used to connect the clamps to the anchor bolts.

Ballast

A counterbalance (or ballast) system uses two rigid metal containers, each with a capacity of 9.5 cubic feet, (269 liters) bolted to the inboard (rear) Trestle Monorail leg. The weight of the material in the containers counterbalances the combined weight of the work load and the hoist at the outboard end of the Trestle Monorail. Ballast material must conform to certain requirements. Suggested materials to use for ballast are: bricks, solid concrete blocks, stone, or other high-density nonflow material. Liquids cannot be used and loose sand, in some installations, may not be a suitable choice. Each container should be filled to the maximum capacity for maximum stability.

Counterweight

This method uses flat, steel counterweights, common to roof outriggers, stacked on an upright 27-inch (68.6-centimeter) post. Clamps and mounting hardware securely attach the upright to the inboard Trestle Monorail legs. Standard 50-pound (22.7-kilogram) counterweights slide down over the upright and counterbalance the system.

3.7 Control Box

Mounted directly below the motor/brake assembly, the control box serves as the central power receiving and sending station for the portable hoist. Electrical power is supplied to the control box through the electrical power source cable. Power is sent out to the control pendant (or wireless remote, if equipped) for hoist commands and operations. Contained within the control box are contactors, capacitors, and other nonuser serviceable electrical components.

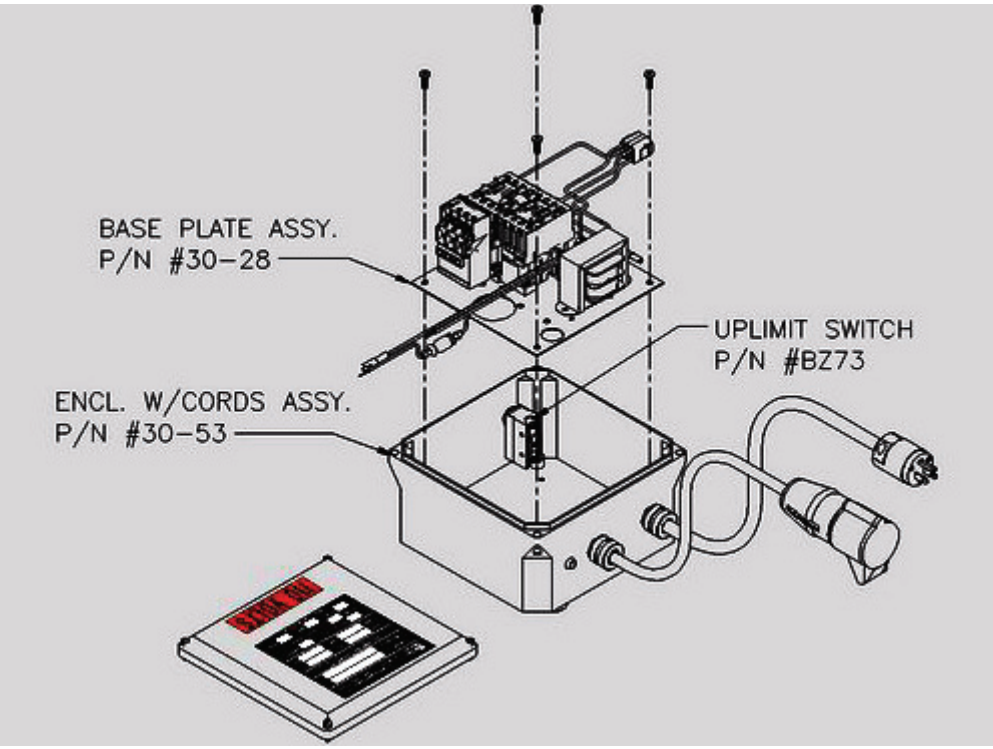


Figure 3.13

Control Box

3.8 Control Pendant

Hoist operations are actuated by the remote control pendant. The basic control pendant for all models (except the Leo VFD) has UP and DOWN push buttons for hoist operation. On the Leo VFD, there are two additional push buttons, one for two-speed hoist operation and one for Emergency Stop. Attached to the standard remote control pendant is a 6-foot (1.8-meter) electrical cable. Optional remote control cable extensions are available in either 25 feet (7.6 meter) or 85 feet (25.9 meter) for all models. Optional control pendants include dual remote controls and dual wireless remote controls. All pendant electrical cables include interlocking connectors at the cable ends.

NOTE: When using the longer remote control extensions, securely attach the cable to firm anchor points to prevent strain on the connectors or the electrical cable. Intermediate connections should use strain relief provisions provided to prevent strain on the connectors.

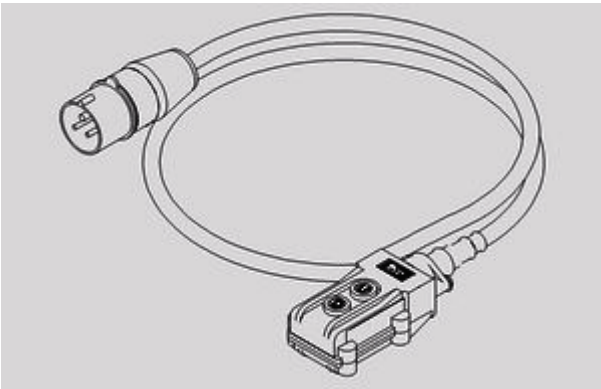


Figure 3.14

Control Pendant

Chapter 4
Specifications

This chapter will cover Beta Max portable hoist specifications including wire rope, lifting capacities, power requirements, unit weights, and additional electrical information.

4.1 Wire Rope and Lifting Specifications

Beta Max portable hoists are equipped with 19 x 7 rotation-resistant wire rope. Rotation-resistant wire ropes are less likely to unravel when loaded. This results in improved rotational stability of the workload. Please refer to the following table for rope diameters, maximum lifting capacities, and maximum lifting heights.

Table 4.1 Wire Rope and Lifting Specifications by Model

Model	Rope Diameter	Max. Lifting Capacity (Single Rope)	Maximum Lifting Capacity (Double Rope)	Maximum Lifting Height (Single Rope)	Maximum Lifting Height (Double Rope)
Beta Lite	5/32 inch (3.969 mm)	200 pounds (91 kg)	400 pounds (181 kg)	60 feet (18.3 m)	30 feet (9.1 m)
Scorpio Plus	3/16 inch (4.7625 mm)	400 pounds (181 kg)	N/A	80 feet (24.4 m)	N/A
Scorpio Plus XL	3/16 inch (4.7625 mm)	400 pounds (181 kg)	N/A	160 feet (48.8 m)	N/A
Gemini Plus	1/4 inch (6.35 mm)	600 pounds (272 kg)	1200 pounds (544 kg)	220 feet (67.1 m)	110 feet (33.5 m)
New Yorker	3/16 inch (4.7625 mm)	600 pounds (272 kg)	N/A	350 feet (106.7 m)	N/A
Leo	5/16 inch (7.9375 mm)	1000 pounds (454 kg)	2000 pounds (907 kg)	220 feet (67.1 m)	110 feet (33.5 m)
Leo XXL	5/16 inch (7.9375 mm)	1000 pounds (454 kg)	2000 pounds (907 kg)	220 feet (67.1 m)	110 feet (33.5 m)

4.2 Hoist Specifications by Model

Beta Max portable hoists are available in a variety of sizes, weights, and lifting speeds. The following table lists features and requirements for each of the specific models.

Table 4.2 Hoist Specifications by Model

Model	Lifting Speed	Voltage and Amperage Requirements	Unit Weight	Shipping Weight
Beta Lite	50 fpm - single rope 25 fpm - double rope	110V AC 6 Amps	30 pounds (13.6 kg)	46 pounds (20.9 kg)
Scorpio Plus	80 fpm	110V AC 15 Amps	80 pounds (36.3 kg)	96 pounds (43.5 kg)
Scorpio Plus XL	80 fpm	110V AC 15 Amps	90 pounds (40.8 kg)	102 pounds (46.3 kg)
Gemini Plus	80 fpm - single rope 40 fpm - double rope	110V AC 20 Amps 220V AC 12 Amps	150 pounds (68 kg)	176 pounds (79.8 kg)
New Yorker	80 fpm	220V AC 12 Amps	180 pounds (81.6 kg)	195 pounds (88.5 kg)
Leo	80 fpm (with Standard Controller and Single Rope) 40 fpm (with Standard Controller and Double Rope)	Standard Controller 220V AC Single-phase -13 Amps Three-phase -15 Amps Variable Frequency Drive Controller 220V AC Single-phase - 12 Amps	165 pounds (74.8 kg)	200 pounds (90.7 kg)

Table 4.2 Hoist Specifications by Model

Model	Lifting Speed	Voltage and Amperage Requirements	Unit Weight	Shipping Weight
Leo XXL	80 fpm (with Standard Controller and Single Rope) 40 fpm (with Standard Controller and Double Rope) Variable Speeds and Soft Start/Stop with Variable Frequency Drive Controller	Standard Controller 220V AC Three-phase - 15 Amps Variable Frequency Drive Controller 220V AC Single-phase - 12 Amps	175 pounds (79.4 kg)	210 pounds (95.3 kg)

NOTE: All models use an extendable pendant controller, except the Leo XXL, which has an extendable pendant with two speeds and Emergency Stop

NOTE: Beta Max requires a 50 percent duty cycle for portable hoists. This means the hoist should be in continuous operation for only 20 minutes out of every 40 minutes.

WARNING

Always replace wire rope with the same diameter and strength specifications of the original wire rope supplied with the hoist. Never replace wire rope with any different specifications without first contacting and consulting the dealer or Beta Max, Inc. If wire rope specifications are not known, contact Beta Max, Inc. with the proper model and serial number to verify correct wire rope specifications for the intended application and model.

4.3 Electrical

Beta Max portable hoists are designed for 110V AC or 220V AC, 60-cycle, single-phase or three-phase, 30-ampere circuitry. Models must be ordered as either 110V AC or 220V AC.

The motor has one primary or strong winding and one secondary or weak winding. The fail-safe conical brake operates from the inductive forces in the rotor created by the AC current through the stator wires.

The hoist is equipped with an UP limit switch that interrupts the 24V DC coil of the UP control relay on remote control models or the primary AC (110V or 220V) line to the upper limit switch on models without remote control relays. This UP limit switch is an emergency safety shutoff and should never be used as a substitute for stopping upward motion.

Push button controls are "deadman" type and work on 24V DC circuitry with remote control and 110V AC or 220V AC on standard units.

On remote control models, a 24V DC output transformer is connected to the primary power when the unit is plugged in. The 24V DC power energizes the UP contactor of the UP limit switch when the hook is not all the way up and the UP push button is pressed. The 24V DC power also energizes the DOWN contactor if the DOWN push button is pressed.

When the UP or DOWN push button is pressed, the operating voltage is applied to the diode bridge. This causes the magnetic brake to overcome the pressure of the three brake springs and pull the brake stationary plate away from the brake disc.

Chapter 5
Operation and Setup

This chapter will cover the operation and setup procedures for Beta Max portable hoists and various mounting systems.

5.1 Operating the Hoist

Before You Begin

Ensure electrical supply power for the hoist is the same as specified on the hoist nameplate. The power source and connecting cables must be of sufficient capacity to carry the hoist current requirements. A minimum of 20-A to 30-A service is required for all models. Electrical extension cable plug ends should be interlocking type. Connectors must be straight, undamaged, and clean and should incorporate suitable ground connections. Electrical cables should be 10 gauge or 8 gauge for extensions; 6 gauge is recommended for excessive lengths. Consult your dealer or Beta Max, Inc. for more information.

Hoist Operation

1. Install the hoist. See **Shrouds and Mounting Tops** and **Mounting Hoist on a Monorail/Trac System for details.**
2. Press the control pendant DOWN push button to lower the cable.
3. Release the push button to stop the cable near the load to be lifted.
4. Attach wire rope cable hook to the workload.
5. Press the UP push button to raise the workload to the desired height.
6. Release the UP push button to stop the hoist. The workload will remain suspended in this position until control pendant push button is pressed again.

NOTE: If load is raised too high, the upper limit bar and switch will stop upward motion. This is an emergency stop and should never be used to control motion in place of the control pendant push buttons. Damage will occur to the hoist if the emergency stop is used improperly.

7. Press the DOWN push button to lower the cable and load to the desired height.

NOTE: Releasing either the UP or DOWN control pendant push button will cut motor power and automatically apply the brake. Always control load lifting/lowering with the pendant control push buttons only.

CAUTION

To prevent equipment damage, DO NOT run the load into the ground and DO NOT use the upper limit switch to stop upward motion.

Load Rotation

Wire rope will stretch and tighten when a load is lifted for the first time. This stretching and tightening of the rope will cause the load to rotate slightly in one direction. The non rotational qualities of the rope will stop this rotation and the rope and load will seek a natural, balanced state. Load rotation may occur due to air currents or the bulk and balance of the payload. A tag line may be attached to the load to help steady and guide it but should **never** be used to pull the load out at an angle away from the hoist.

NOTE: If a tag line is used incorrectly, damage to the upper limit switch, up limit bar, and wire rope will result.

5.2 Single-Rope Rigging

Single-rope rigging is used for most conventional lifting and allows the maximum lifting height and speed for the hoist. No special setup is needed for operation. Simply attach the hook at the end of the cable to the load. For wire rope and hoist maximum load lifting capacities, see **Table 4.1**.

Maximum Working-Load Capacity

Every wire rope user should be aware of the fact that each type of fitting attached to a wire rope has a specific efficiency rating which can reduce the working load of the rope assembly or rope system, and this must be given due consideration in determining the capacity of a wire rope system.

NOTE: ISO 4309:2004 details wire rope in-service guidelines for the care, maintenance, installation, examination, and discard criteria for safe use of the hoist.

5.3 Double-Rope Rigging

Double-rope rigging allows lifting twice the weight of a single-rope rigging by using a pulley and hook combination that provides a mechanical advantage to lifting.

NOTE: Double-rope rigging will reduce the lifting height and speed to 1/2 load capacity for your hoist. Be certain your mounting is rated for the increased weight that double-rope rigging will allow.

1. Attach the wire rope and thimble to the side of the hoist with the shackle.
2. Install the safety pin and keeper.
3. Unscrew and remove the center bolt of the 8-inch pulley/hook.
4. Remove the wheel.
5. Insert the cable around the wheel.
6. Reinstall the pulley wheel and center bolt. Be sure to secure the bolt with the safety clip provided. This bolt MUST be secured with a safety clip.
7. Attach the hook to the workload.

WARNING

No wire rope or wire rope sling should ever be installed or used without full knowledge, consideration, and application of the design factor for the intended use. Failure to comply may result in equipment damage, bodily injury, or possible death.

WARNING

If the usability or integrity of the wire rope is ever in question, replace the wire rope immediately to avoid possible personal injury or potential equipment damage.

WARNING

Never use a rope that has become knotted. It is unusable at this point and should be discarded.

5.4 Mounting System Setups and Installations

Vertical Post Mounting Options

Vertical post mounting refers to any hoist that is attached to a vertical steel member, a between-floor mount, a window mount, or scaffold post mount. Post mounting is simple and quick. The following represents different vertical post mounting options.

Between-Floor Mount

For use at the edge of balconies or just inside doors where both the upper and lower end of the mount rests against a strong, flat surface.

Window Mount

For use inside of masonry windows.

Scaffold Post Mount

For use on a corner, vertical leg of steel scaffold.

NOTE: Vertical post mounting is only approved for use on masonry walls and only for use with Beta Lite, Scorpio Plus, and Scorpio Plus XL models.

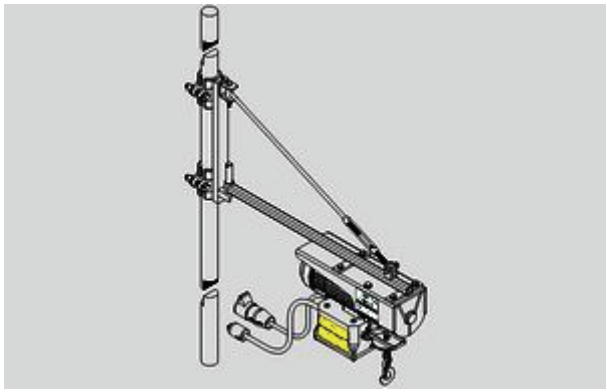


Figure 5.1

Vertical Post Mounting Shown with Beta Lite Hoist

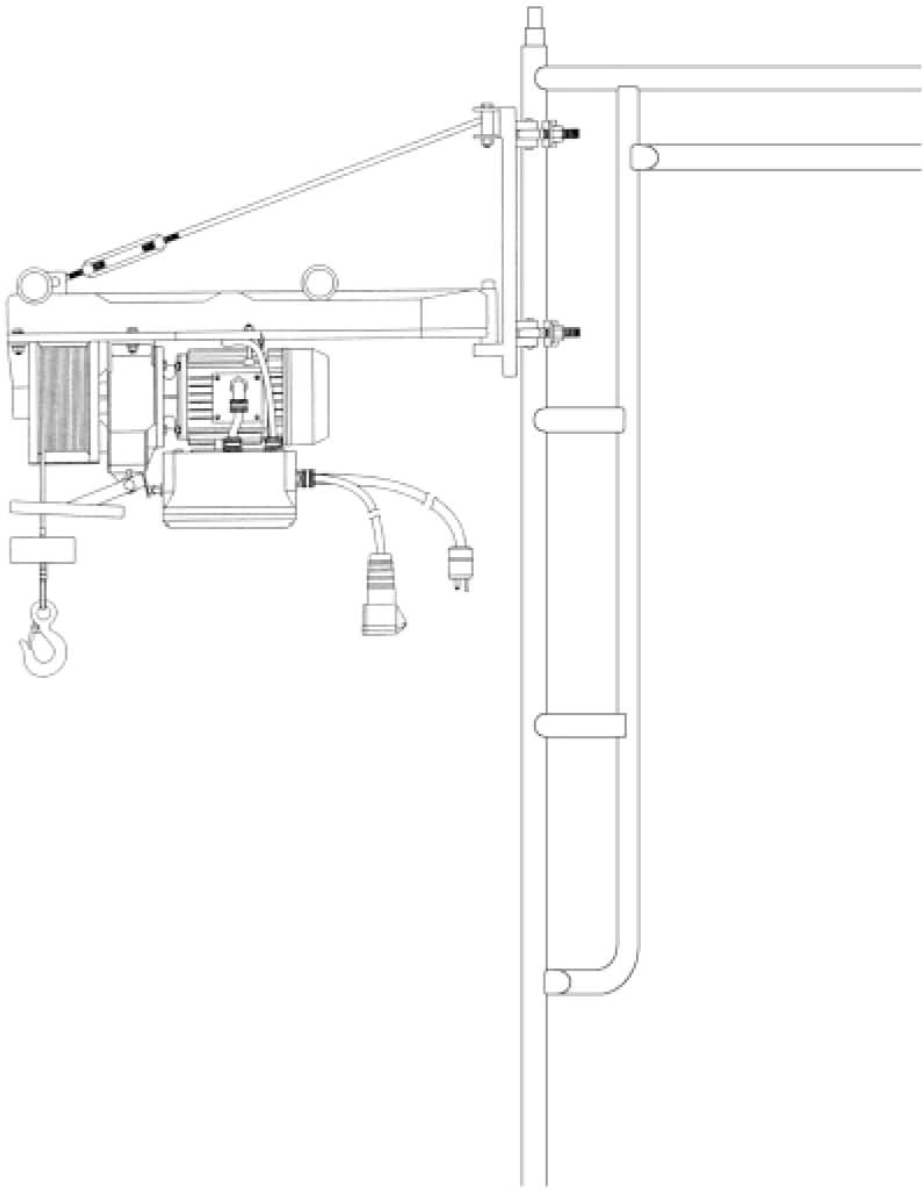


Figure 5.2

Vertical Post Mounting Shown with Scorpio Plus (XL) Hoist

Assembly/Installation of Between-Floor Mount or Window Mount Systems

The between-floor mount or window mount is used where both the upper and lower end of the mount rests against a strong, flat surface. The small diameter end of the mount is placed toward the ceiling and the larger diameter tube is set toward the floor. Tighten the system with the adjustment screw to lock the vertical post between the two surfaces. Make sure the post is vertical to the floor. Attach the vertical post mounting clamps as high as possible on the floor or window mount. Connect the hoist to the vertical post mount by placing the inboard end of the hoist shroud on the lower peg and connecting the turnbuckle to the top of the post mount. Adjust the turnbuckle and use a level to make sure the hoist is completely horizontal and level with the ground. This will ensure proper spooling of the wire rope on the drum.

Assembly/Installation of Scaffold Post Mount System

The scaffold post mount is used to attach the hoist to the vertical corner leg of steel scaffold. The scaffold section that is to be mounted to should be erected and properly secured to the building face. All sections should be correctly secured to each other. Diagonal braces for the scaffold sections must also be in place. At the load/unload level, attach the vertical post mounting clamps as high as possible. Connect the hoist to the vertical post mount by placing the inboard end of the hoist shroud on the lower peg and connecting the turnbuckle to the top of the post mount. Adjust the turnbuckle and use a level to make sure the hoist is completely horizontal and level with the ground. This will ensure the proper spooling of the wire rope on the drum.

CAUTION

Do not mount the hoist to free-standing scaffold. Scaffold must be secured to a building face. Counterweights of the proper amount should always be used.

Counterbalancing Scaffold Post-Mounted Systems

It is recommend to always use counterbalance when utilizing a hoist system in conjunction with a scaffold system. To determine the proper amount of counterweight to use, see the formula below.

When mounting to a scaffold using a vertical post mount, use a 1:1 design factor. This means that the counterweight must equal the weight of the hoist and the weight of the load combined. An example of how to determine the proper amount of counterweight is provided below.

Scorpio Plus (100 pounds) lifting a 400-pound load on a Vertical Post Mount

100 + 400 = 500 pounds total counterweight needed

I-Beam Mounting

Beta Max, Inc. provides two options for attaching the hoist to either an existing or customer supplied I-Beam. One option is the rolling I-Beam Trolley Top for applications that require horizontal rolling movement of the hoist and load. The other option is the Fixed I-Beam Top for attaching a portable hoist to an I-Beam where movement is not required. This option firmly holds the hoist in a stationery, or fixed, position on the I-Beam.

CAUTION

Always confirm the I-Beam strength relative to the combined weight of the hoist and load being lifted and the length of cantilever being used.

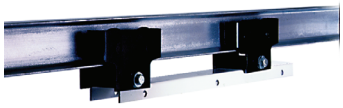


Figure 5.3

I-Beam Trolley Top

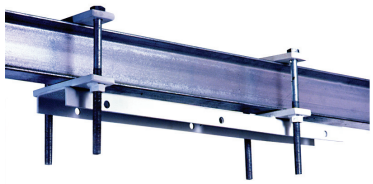


Figure 5.4

Fixed I-Beam Top

NOTE: The rolling Trolley Top and the Fixed Trolley Top can be used on steel I-Beams ranging in size from 4 inches to 10 inches (10.2 cm to 25.4 cm) and with flange sizes from 2.66 inches to 4.66 inches (6.75 cm to 11.83 cm).

I-Beam Suspension Brackets

Beta Max, Inc. also offers I-Beam suspension brackets that provide a way to hang a section of I-Beam directly below the horizontal ledger of a 6-foot (1.8-meter) walk-through scaffold frame (similar to the Scaff-Trac Mounting System).

The optional I-Beam suspension brackets are designed to attach to the top of a steel I-Beam and pull it up tight against the underside of the scaffold frame horizontal ledger. The spacing between the top and bottom horizontal ledger on 6-foot (1.8-meter) walk-through frames varies from one brand of scaffold to another. The amount of space or gap between the top of the I-Beam and the lower horizontal ledger of the scaffold frame should be as little as possible. The saddles and mounting brackets are designed with multiple holes to allow mounting to various scaffold frames. These holes allow for minimum top to bottom ledger distance of 5/8 inch (1.6 cm), an intermediate distance of 6 inches (15.2 cm), and maximum distance of 6-1/4 inches (3.8 cm).

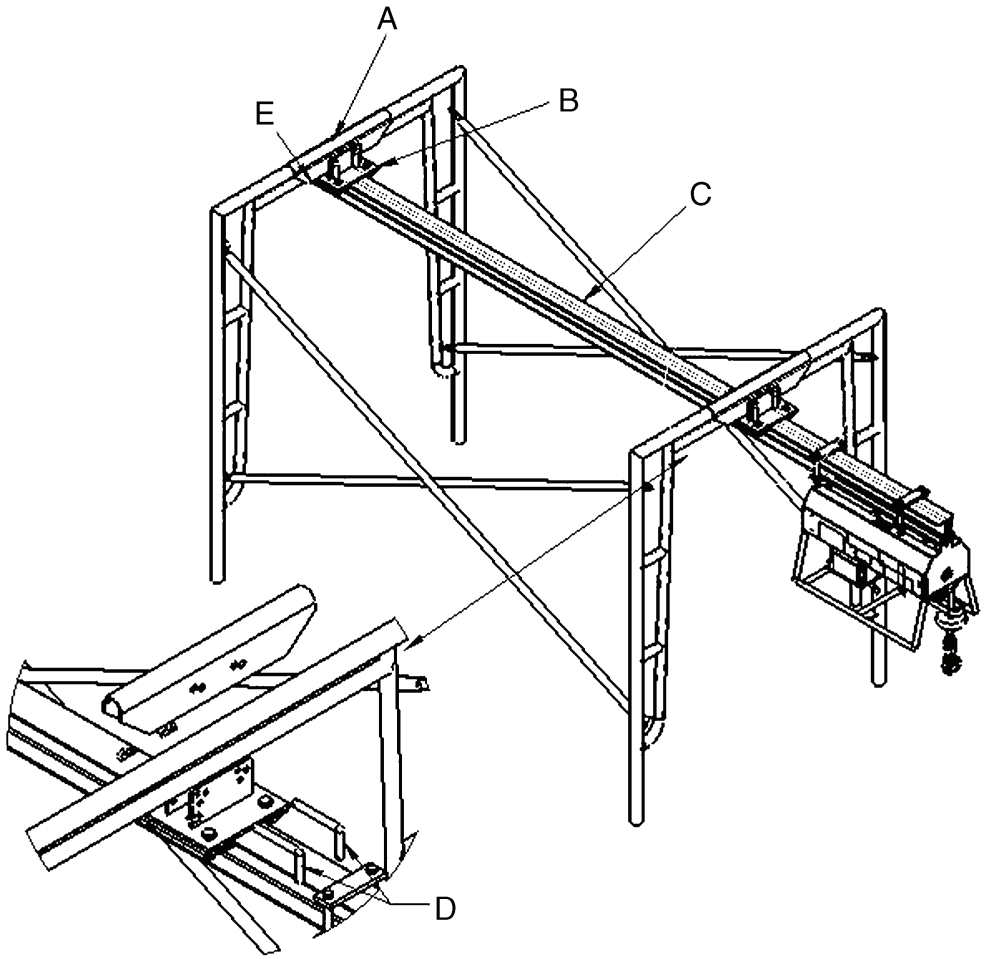


Figure 5.5

I-Beam Suspension Brackets

Table 5.1 I-Beam Suspension Bracket Parts List

Item	Description
A	Saddle
B	I-Beam bracket
C	Steel I-Beam (Customer supplied)
D	Mounting pins with keepers
E	Inboard end retaining pin

CAUTION

If using a customer supplied I-Beam, the outboard end of the beam must have a welded, capped end to prevent the hoist from rolling off the end of the I-Beam.

Installing an I-Beam on Scaffold Using Suspension Brackets

1. Place one saddle (A) over the center of each of the scaffold frames. The holes in the saddles should line up. Two sets of holes in each saddle allow for variations in scaffold frames.
2. Connect one mounting bracket (B) at the location on the I-Beam to match up with the saddle connecting point.
3. Raise both ends of the I-Beam (C) to the under side of the saddles (A). Make sure the capped end is at the outward end of the scaffold.
4. Insert the pins and keepers (D) into the same set of holes on each saddle.
5. Once hoist is mounted, insert inboard end retaining pin (E).

NOTE: Check the I-Beam with a level. If the I-Beam is not level, adjust until it is level. Unit must be level for correct hoist operation.

NOTE: I-Beam cantilevers should never exceed 4 feet (1.2 meters) in length.

Scaff-Trac Mounting

Mounting Site Preparation

As the name implies, the Scaff-Trac hoist mounting option is designed for use on any 6-foot (1.8-meter) walk-through scaffold frames. The cross brace spacing between frames must be set at 7 feet (2.1 meters). An optional Scaff-Trac designed for use with 8-foot (2.4-meter) cross bracing is available. The Scaff-Trac allows for a 3-1/2-foot (1.1-meter) cantilever with 7-foot (2.1-meter) cross braces or a 2-1/2-foot (0.7-meter) cantilever with 8-foot (2.4-meter) cross braces. A full width deck must be installed at the hoist location to provide adequate working room and footing for installing and operating the hoist. The scaffold must be horizontally level (check the scaffold manufacturer's mounting specifications for leveling the scaffold platform). Guardrails and toe boards may also be necessary (check local or national safety requirements).

Scaffold frames must be in good condition and free of dents, bends, heavy corrosion, cuts, modifications, or any other damage. All cross braces must be in place and secured before attempting to install the Scaff-Trac. Scaffold frames must be pinned or bolted to the frames below and all frames must be anchored securely to the vertical building face. Check with the scaffold manufacturer for the correct way to erect and anchor the scaffold. Use no less than two people to install the Scaff-Trac.

The design of the saddles and mounting brackets on the Scaff-Trac are intended to allow mounting on various brands of scaffold. The spacing between the top and bottom horizontal ledger on 6-foot (1.8-meter) walk-through frames varies from one brand of scaffold to another. The amount of space or gap between the top of the Scaff-Trac and the lower horizontal ledger of the scaffold frame should be as little as possible. The saddles and mounting brackets are designed with multiple holes to allow mounting to various scaffold frames. These holes allow for minimum top to bottom ledger distance of 5/8 inch (1.6 cm), an intermediate distance of 6 inches (15.2 cm), and maximum distance of 6-1/4 inches (3.8 cm).

Scaff-Trac Models Available

Table 5.2 Scaff-Trac Models

	Model 60-4 (Basic 7-foot)	Model 60-41 (Special 8-foot)	Model 60-11 (Extension)
Used on	7-foot scaffold	8-foot scaffold	7-foot scaffold
Load-Bearing Capacity	1200 pounds (544 kg)	1200 pounds (544 kg)	1200 pounds (544 kg)
Unit Weight	155 pounds (70 kg)	155 pounds (70 kg)	85 pounds (39 kg)
Extendable	YES	NO	YES
Adaptable to Trestle Monorail System	YES	NO	NO

Scaff-Trac and Scaff-Trac Extension Assembly and Mounting

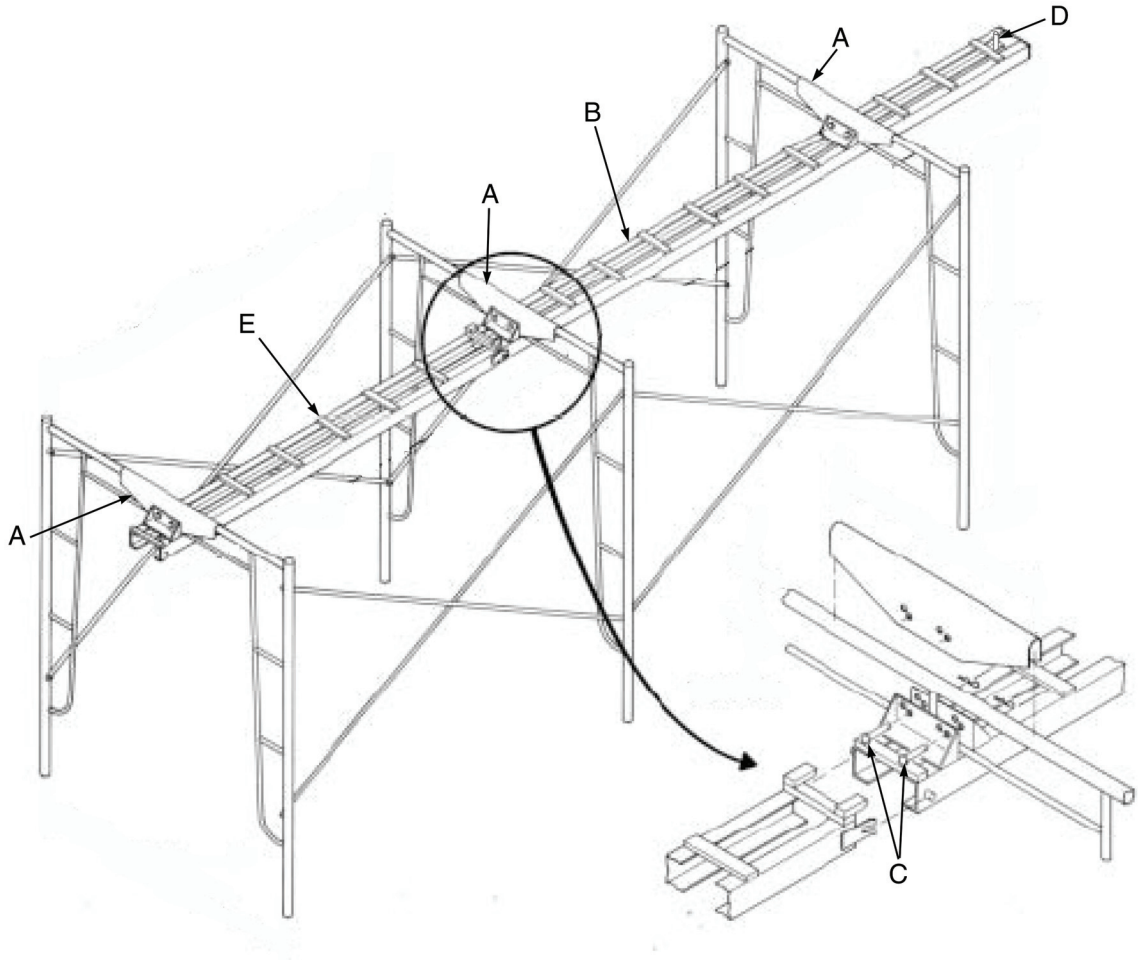


Figure 5.6

Scaff-Trac and Scaff-Trac Extension

Table 5.3 Scaff-Trac Parts List

Item	Description
A	Saddles
B	11-foot Scaff-Trac Monorail/Trac
C	Mounting pins with keepers
D	Inboard end retaining pin
E	7-foot Scaff-Trac Extension

Scaff-Trac Parts List

1. Two saddles (A)
2. One 11-foot Scaff-Trac Monorail/Trac (B)
3. Four mounting pins with keepers (C)
4. Inboard end retaining pin (D)

Installing Scaff-Trac Monorail

1. Place one saddle (A) over the center of each of the scaffold frames. The holes in the saddles should line up. Two sets of holes on each saddle allow for variations in scaffold frames.
2. Raise both ends of the Scaff-Trac Monorail/Trac (B) to the under side of the saddles (A).
3. Insert the pins and keepers (C) into the same set of holes on each saddle.
4. Once the hoist is mounted, insert inboard end retaining pin (D).

NOTE: Check the Scaff-Trac with a level. If Scaff-Trac is not level, adjust until it is level. Unit must be level for correct hoist operation.

Scaff-Trac Extension Parts List

1. One 7-foot Scaff-Trac Monorail/Trac extension (E)
2. One saddle (A)
3. Four mounting pins with keepers (C)

Attaching the Scaff-Trac Monorail Extension

The Scaff-Trac Monorail/Trac (B) must be correctly mounted before an extension is added. Multiple extensions can be added to the system as needed.

1. Place the saddle (A) over the next scaffold frame on the inboard side of the previously mounted Scaff-Trac (B).
2. Lift the outboard end of the Scaff-Trac extension (E) to the inboard end of the Scaff-Trac (B).
3. Correctly align the Scaff-Trac and extension (E) with the alignment ears and tabs.
4. Slide the extension (E) into place.
5. Raise the inboard end of the extension (E) up to the saddle (A) and secure the extension with the pins and keepers (C).
6. Install any additional extensions in the same way.
7. Once the hoist is mounted, insert inboard end retaining pin (D).

Mac-Trac Mounting

(For Use with Scorpio Plus and Scorpio Plus XL Model Hoists Only)

Mounting Site Preparation

Designed for masons and chimney builders, the Mac-Trac is made for lifting materials to workmen on a short run of scaffold while still allowing for sufficient work area on the platform. The Mac-Trac mounting option is designed for use on most scaffold frames. It mounts easily on top of existing 4-, 5-, or 6-foot (1.2-, 1.5-, 1.8-meter) standard 1-5/8 inch- (0.3175 centimeter-) tubular scaffold frames. The cross brace spacing between frames must be set at 7 feet (2.1 meters). A full-width deck must be installed at the hoist location to provide adequate working room and footing for installing and operating the hoist. The scaffold must be horizontally level. Check the scaffold manufacturer's mounting specifications for leveling the scaffold platform. Guardrails and toe boards may also be necessary (check local or national safety requirements).

Scaffold frames must be in good condition and free of dents, bends, heavy corrosion, cuts, modifications or any other damage. All cross braces must be in place and secured before attempting to install the Mac-Trac. Scaffold frames must be pinned or bolted to the frames below, and all frames must be anchored securely to the vertical building face. Check with the scaffold manufacturer for the correct way to erect and anchor the scaffold.

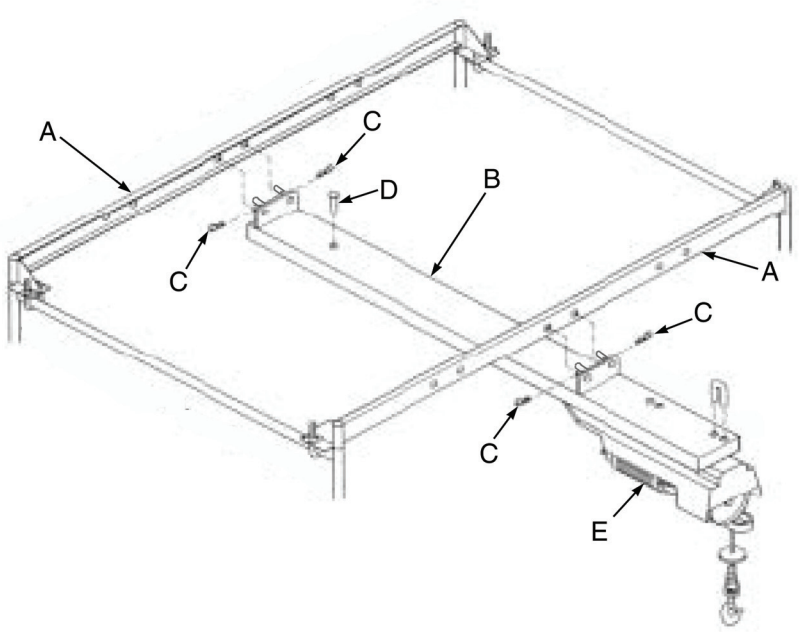


Figure 5.7

Mac-Trac Components

Table 5.4 Mac-Trac Parts List

Item	Description
A	7-foot horizontal braces
B	7-foot Mac-Trac Monorail/Trac
C	Retaining clips
D	Retaining pins
E	Hoist

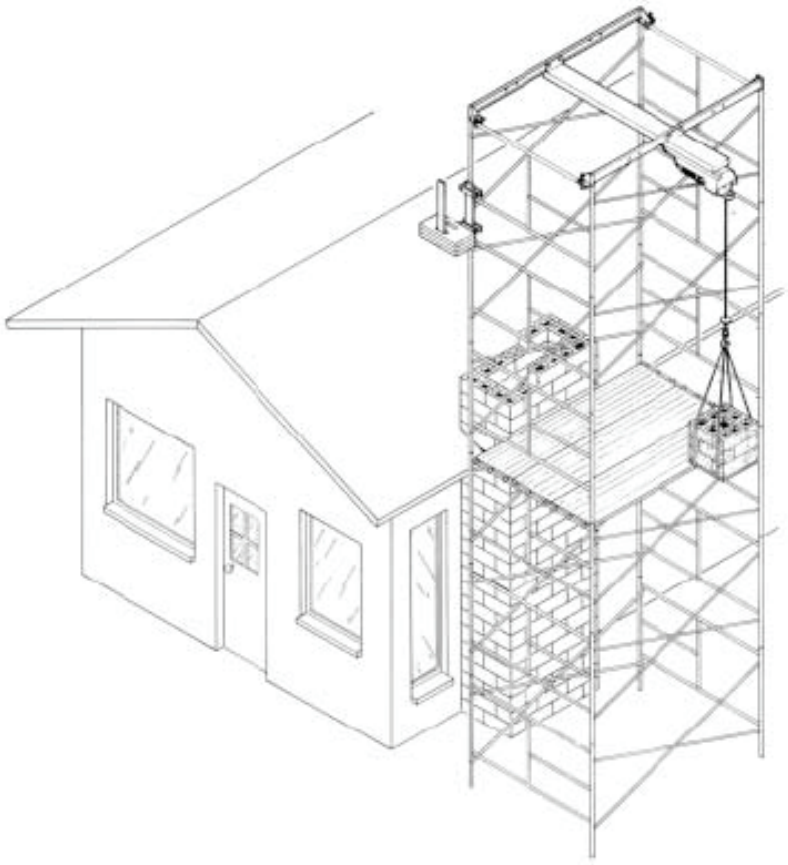


Figure 5.8

Example of Mac-Trac Setup

Mac-Trac Parts List

1. Two 7-foot horizontal braces (A)
2. One 7-foot Mac-Trac Monorail/Trac (B)
3. Four retaining clips (C)
4. Two retaining pins (D)

Installing the Mac-Trac

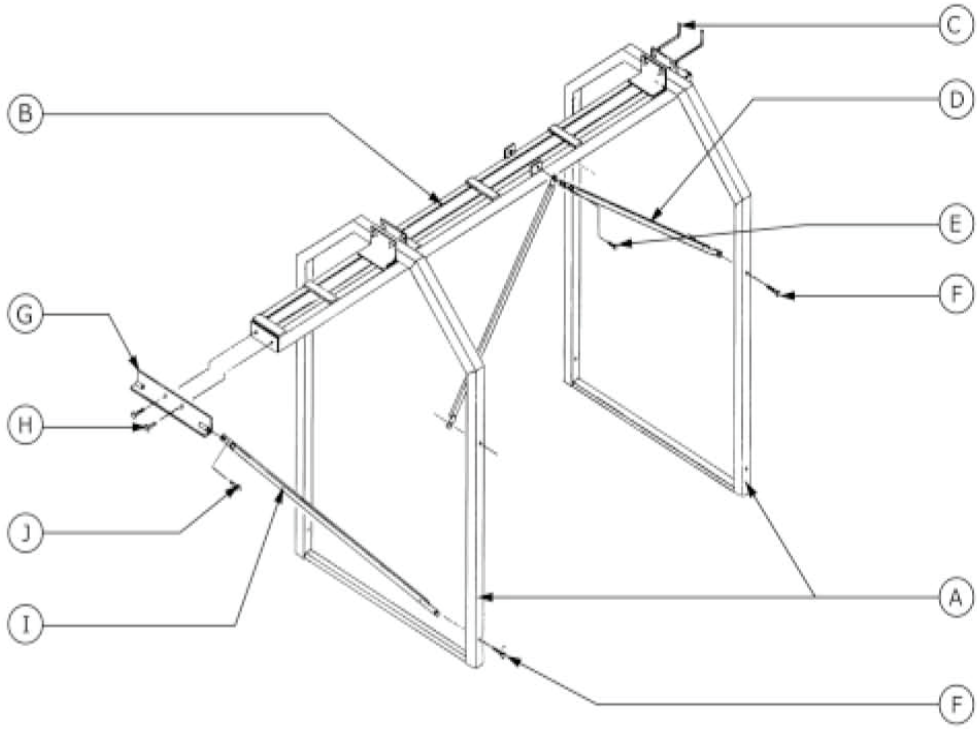
1. Set one 7-foot brace (A) on top of the scaffold frame coupling pins.
2. Ensure gravity lock pins click in place.
3. Set the other 7-foot brace (A) on top of the scaffold frame coupling pins.
4. Ensure gravity lock pins click in place.
5. Secure both braces to the scaffold with J-hook clamps
6. Braces have three sets of holes for mounting the Monorail/Trac. Choose the desired location (left, center, or right).
7. Lift up the Mac-Trac Monorail/Trac (B) and align the mounting studs with the desired set of brace mounting holes.
8. Slip the Mac-Trac Monorail/Trac (B) into the holes.
9. Place the retaining clips (C) through the Monorail/Trac mounting studs.
10. Raise up the Scorpio Plus or Scorpio Plus XL hoist and slide it into the open end of the Monorail/Trac.
11. Secure the hoist in place with the retaining pins and keepers (D).
12. Remove the cross braces at the load/unload level only.
13. Replace the cross braces with horizontal brace for safety.

Trestle Monorail Mounting

Mounting Site Preparation

The Trestle Monorail is a universal mounting option system for all Beta Max portable hoists and is ideal for mounting on a flat roof or an intermediate floor. The system allows a 3.5-foot (1.1-meter) cantilever. Two people can assemble the system in minutes. An area of approximately 10 feet x 15 feet (3.1 meters x 4.6 meters) is needed to properly assemble the unit. The preferred method is to assemble the system at the same location of intended installation. An alternative method is to put the system together in one place and transport the assembled unit to the installation area. The Trestle Monorail is available in two different capacity versions, 1200 pound (544 kg) capacity or 2000 pound (907 kg) capacity.

The foundation under the Trestle Monorail must be adequate to support the total weight. Load-spreading planks must be placed under the Trestle Monorail if the combined weight for the ballast, payload, trestle, and hoist exceeds the unit loading capacity of the floor. Use tie-back cables on all methods of anchoring. Always tie back the rear arches of the Trestle Monorail.



ITEM	PART #	DESCRIPTION	QTY.
A	30-76	Uprights	2
B	60-4	Scaff/Trestle Trac	1
C	10-63	Track Mounting Pins with Keepers	4
D	30-77	Braces 1,200 lb. system	4
E	590	Cap screws	2
F	790	Cap Screws and Nuts 1,200 lb. / 2,000 lb. system	4 / 6
G*	30-75	Cantilever Braces Brackets 2,000 lb. system	1
H*	707	Cap Screws	2
I*	30-74	Cantilever Braces 2,000 lb. system	2
J*	606	Cap Screws and Nuts	2
K	10-64	Hoist Stop Pin with Keeper	1

Figure 5.9

Trestle Monorail

Parts List for 1200-Pound (544-kg) Capacity Trestle Monorail

1. Two Trestle Monorail uprights (A)
2. One Scaff-Trac Monorail (B)
3. Four Trac mounting pins with keepers (C)
4. Four 1200-pound capacity braces (D)
5. Two capscrews (E)
6. Four capscrews and nuts (F)
7. One hoist stop pin with keeper (K) (not shown)

Assembling the 1200-Pound (544-kg) Capacity Trestle Monorail

1. Attach one end each of the four braces (D) to the sides of both uprights (A) using capscrews and nuts (F). Hand-tighten nuts only.
2. Join the free end of the braces (D) together on one side in the center using capscrews (E). Hand-tighten only. This is a temporary support step.
3. Join the free end of the other two braces (D) together on the other side in the center using capscrews (E). Hand-tighten only. This is a temporary support step.
4. Measure and space the uprights (A) approximately 7 feet (2.1 meters) apart.
5. Place one end of the Scaff-Trac Monorail (B) in position to one of the uprights (A) by aligning the Trestle Monorail bracket to the upright.
6. Lift up the Trestle Monorail (B) and slip the bracket into position on the bottom side of the upright (A).
7. Secure the Scaff-Trac Monorail (B) to the upright (A) by inserting two pins (C) through the Trestle Monorail brackets.
8. Insert the keepers (C) into the pins.
9. Repeat Steps 5 - 8 for attaching the other end of the Scaff-Trac Monorail (B) to the remaining upright (A).

10. Remove the temporary capscrews (E) from braces (D).
11. Connect two braces (D) on one side to the center tab of the Scaff-Trac Monorail (B) using cap screws (E).
12. Hand-tighten the nuts.
13. Repeat Steps 11 - 12 for the other side.
14. Measure the distance between both uprights in two places (left and right sides) to ensure the unit is square. If the measurements are the same (left and right), the unit is square and no more attention is needed. If the measurements are not the same, nudge or move the unit, remeasure and continue until the unit is square.
15. Once the unit is square, tighten all capscrews and nuts.
16. Attach the correct counterbalancing. (See **Counterbalancing Calculations** for details)

Parts List for 2000-Pound (907-kg) Capacity Trestle Monorail

1. Two Trestle Monorail uprights (A)
2. One Scaff-Trac Monorail (B)
3. Four Trac mounting pins with keepers (C)
4. Four 1200-pound (907-kg) capacity braces (D)
5. Two capscrews (E)
6. Six capscrews and nuts (F)
7. One cantilever brace bracket (G)
8. Two capscrews (H)
9. Two cantilever braces (I)
10. Two capscrews and nuts (J)
11. One hoist stop pin with keeper (K) (not shown)

Assembling the 2000-Pound (907-kg) Capacity Trestle Monorail

The assembly method for the 2000-pound (907-kg) capacity Trestle Monorail is nearly identical with the 1200-pound (544-kg) capacity model with the exception of the following steps. Therefore, follow **Steps 1 - 11** for the **1200-pound (907-kg) Capacity Trestle Monorail** first and then proceed with the next additional steps.

NOTE: The only physical differences between the two variations of Trestle Monorail are the addition of cantilever braces, a cantilever brace bracket, bolts, and nuts for the 2000-pound (907-kg) capacity model.

1. Attach the cantilever brace bracket (G) to the Scaff-Trac Monorail (B) using capscrews (H).
2. Attach one end of the cantilever braces (I) to the upright (A) using capscrews and nuts (F).
3. Attach the other end of the cantilever braces (I) to the cantilever brace bracket (G) using capscrews (H).
4. Tighten all capscrews and nuts.

NOTE: Once the Trestle Monorail is assembled, it must be properly anchored before it can be used with a portable hoist. Beta Max, Inc. warranties cover only the following four methods of anchoring: Trestle Monorail ceiling brace, floor tie-down clamps, ballast containers, and counterweight.

5.5 Methods of Anchoring the Trestle Monorail

Trestle Ceiling Brace

Use this method when the Trestle Monorail will be installed on an intermediate floor of a building with a rigid structural ceiling above. After the Trestle Monorail is assembled and placed in the desired location, a jack is bolted to the top of the inboard (rear) end of the Trestle Monorail. The jack is extended until it makes firm contact with the ceiling. This locks the Trestle Monorail between the ceiling and the floor and stabilizes the system.

Floor Tie-Down Clamps

For a more permanent application, anchor bolts are secured to the floor near the base of the inboard (rear) end of the Trestle Monorail uprights. Either Beta Max floor tie-down clamps, a heavy chain, or equivalent is used to connect the clamps to the anchor bolts.

Ballast

A counterbalance (or ballast) system uses two rigid metal containers, each with a capacity of 9.5 cubic feet (269 liters), bolted to the inboard (rear) Trestle Monorail leg. The weight of the material in the containers counterbalances the combined weight of the workload and the hoist at the outboard end of the Trestle Monorail. Ballast material must conform to certain requirements. Suggested materials to use for ballast are: bricks, solid concrete blocks, stone, or other high-density nonflow material. Liquids can not be used and loose sand, in some installations, may not be a suitable choice. Each container should be filled to the maximum capacity for maximum stability.

Counterweight

This method uses flat, steel counterweights, common to roof outriggers, stacked on an upright 27-inch (68.6-centimeter) post. Clamps and mounting hardware securely attach the upright to the inboard Trestle Monorail legs. Standard 50-pound (22.7-kilogram) counterweights slide down over the upright and counterbalance the system.

5.6 Mounting Hoist on a Monorail/Trac System

Monorail/Trac mounting is only possible with hoists that have rollers attached. See **Table 3.1** for further information about mounting options for the hoist being used. Due to the weight and size, Beta Max, Inc. recommends using two or more people to install the hoist.

1. Remove the retaining pin or bolts from the inboard end of the Monorail/Trac.
2. Raise the hoist and roll it into the Monorail/Trac.
3. Reinstall the retaining pin or bolts at the end of the Monorail/Trac to prevent the hoist from rolling out.

CAUTION

When installing the hoist, use caution to avoid pinching fingers and hands. Pay special attention to the area of rollers to avoid potential injury.

4. Move the hoist along the full length of the Monorail/Trac to ensure it rolls freely. If the hoist does not move freely, clean any dirt, rust, mortar, or other debris from the inside of the Monorail/Trac before using.
5. Verify the Monorail/Trac is horizontally level and mounted securely. If the hoist does not remain in one spot and moves on its own, the Monorail/Trac is not level. The Monorail/Trac must be set level before using.

5.7 Counterbalancing of Monorail Systems

When the load is at the outboard end of the Monorail/Trac, the inboard end of the Monorail/Trac will have a lifting tendency, and must be properly counterbalanced or secured in place. A load suspended at the outboard end of the Monorail/Trac will exert an upward force of approximately one half its weight on the inboard end of the Monorail/Trac.

Scaffold sections in a Scaff-Trac mounting system must be pinned or bolted together to resist the weight of the load at the outboard end. In addition, extra weight can be added above the rear (inboard end) scaffold frame. When first lifting the maximum weight, the job superintendent should inspect the scaffold in the vicinity of the hoist operation to ensure that the scaffold components are NOT distorted or separated.

Counterbalancing Calculations

For safe equipment operation, the proper amount of counterweight must be calculated and applied. The Trestle Monorail and Scaff-Trac use one type of calculation, and the Vertical Post type mounting system uses another. Know which system is being used and apply the appropriate calculation. This calculated amount of weight must be used to counterbalance the system.

When mounting to Trestle Monorail or Scaff-Trac:

1. Know or find the weight of the hoist model being used.
2. Know or find the weight of the payload to be lifted.
3. Know or find the length of the outward cantilever.
4. Add the weights of the hoist and the load together.
5. Multiply this number by the length of the outward cantilever.
6. Multiply this number by two. This is a safety factor multiplier.
7. Divide by the length of the backward cantilever.
8. This number is the amount of weight required to counterbalance the system.

In the following example, a Gemini Plus hoist is being used to lift 600 pounds on a Scaff-Trac system. A Gemini Plus weighs 150 pounds, the Scaff-Trac has a 3.5 foot cantilever, and the backward cantilever length is 7 feet.

600 (load) + 150 (hoist weight) = 750

750 x 3.5 (cantilever length) = 2,625

2,625 x 2 (safety factor) = 5,250

5,250/7 (backward cantilever length) = 750 pounds. This is the amount of weight required to counterbalance the system.

When mounting to Vertical Post:

The Vertical Post-type system requires very little to calculate the required weight to counterbalance the system. Simply add the weight of the hoist model being used to the weight of the workload to be lifted. This calculated amount of weight must be used to counterbalance the system.

1. Know or find the weight of the hoist model being used.
2. Know or find the weight of the payload to be lifted.
3. Add the weights of the hoist and the load together.
4. This number is the amount of weight required to counterbalance the system.

In the following example a Scorpio Plus XL hoist is being used to lift 400 pounds on a Vertical Post system. A Scorpio Plus XL weighs 100 pounds.

400 (load) + 100 (hoist weight) = 500 pounds total counterweight required.

Chapter 6
Maintenance and Care

This chapter will cover the maintenance and care for Beta Max portable hoists.

6.1 Care and Storage

Beta Max portable hoists are rugged and durable. However, because they are used under all sorts of conditions, service timetables and guidelines must be followed for hoist optimum performance and safety. Store the hoist away from excess moisture when not in use. Keep the hoist covered if it is being stored in a corrosive environment. On a daily basis remove all debris, mud, dirt, or other foreign materials from the hoist and all auxiliary equipment.

Motor and Electrical Connectors

Be careful not to damage the motor housing cooling fans. If the fins are broken, have the motor examined immediately by a qualified technician. Do not allow the pendant control switch to become submerged in water or any other liquid. Keep all electrical cables and connections from becoming cut, bent, corroded, or damaged in any way.

Wire Rope (General)

Ensure the wire rope is not bent, kinked, corroded, knotted, or damaged in any way. If the wire rope shows any of these conditions, immediately replace the wire rope. During normal hoist operation and typical wear, the wire rope will lose some of its original lubricant. It is extremely important that the wire rope is always lubricated. Use 90W gear lube generously (not dripping) applied with a shop towel.

WARNING

Always wear heavy gloves when handling the wire rope to prevent possible hand injury. Never place hand between UP limit bar and drum.

Transmission

The transmission gear reduction assembly is completely enclosed in a die-cast aluminum housing with a sealed lubrication system and is maintenance free. A monthly inspection for leaks and housing damage is recommended. After the first year of use, Beta Max suggests an inspection by a factory service center.

Roller Mounting Tops

Inspect and/or clean I-Beam surfaces to make sure no mud, dirt, or other debris is present. Ensure all bolts and securing hardware are tight and rollers are turning freely before using hoist.

6.2 Removal of Wire Rope

Before attempting wire rope removal, ensure the hoist is mounted securely in position, level, and the power is disconnected.

WARNING

Keep fingers and hands away from drum when hoist is operating.

CAUTION

Always wear heavy gloves when handling the wire rope to prevent possible hand injury.

1. Remove the headache ball (weight), thimble, and hooks from the wire rope.
2. Connect hoist to the correct power source.
3. Press the DOWN control pendant push button until the rope is completely unspooled from the drum.
4. Locate the cavity in the front of the drum.
5. Pull the rope sleeve end out of the drum about 6 inches (15 cm).
6. Cut the wire rope and remove the sleeve.
7. Remove the wire rope from the drum.

6.3 Installing Wire Rope

WARNING

Keep fingers away from drum when hoist is operating.

WARNING

No wire rope or wire rope sling should ever be installed or used without full knowledge, consideration, and application of the design factor for the intended use. Failure to comply may result in equipment damage, bodily injury, or possible death.

WARNING

Always replace wire rope with the same diameter and strength specifications of the original wire rope supplied with the hoist. Never replace wire rope with any different specifications without first contacting and consulting the dealer or Beta Max, Inc. If wire rope specifications are not known, contact Beta Max, Inc. with the proper model and serial number to verify correct wire rope specifications for the intended application and model.

Preliminary Information

Before installing wire rope, ensure the portable hoist is securely mounted in position and level and the power is disconnected. Be sure to install the correctly specified rope diameter and length for the hoist model being used (see **Table 4.1** for specifications).

When uncoiling new wire rope, always roll the coil like a hoop. Never lay the coil of wire rope down and throw it out in loops. If this happens, kinks are likely to form and the wire rope becomes twisted and hard to handle and can lead to possible damage and premature failure.

Installing Wire Rope

For safety purposes, Beta Max, Inc. will only provide complete wire rope kits for replacing factory-installed wire rope on your hoist. The wire rope kit includes one nonterminated end for threading into hoist drum and one finished end with cableweight, hook, and proper termination. Beta Max, Inc. also provides both Nicopress® fittings and saddle clamps for securing the non terminated end of the wire rope into the drum.

1. Remove the old wire rope from the hoist and discard properly.
2. Thread the nonterminated end of the new wire rope kit through the UP limit bar.
3. Slide the nonterminated end of the wire rope through the small hole in the front end of the drum and pull the rope through the side cavity hole of the drum.
4. If using Nicopress® fittings, slip the copper sleeve over the nonterminated end of the wire rope and crimp three times with a crimping tool. A properly crimped sleeve, when finished, should measure 0.580 inch (14.73 mm) in diameter.
5. If a crimping tool is not available, use the two 1/4-inch (6.35-mm) wire rope saddle clips on the nonterminated end of the wire rope.
6. Push either the Nicopress® fittings (or the wire rope saddle clips) back inside the drum and pull the wire rope tight.
7. Hold the wire rope with a gloved hand (while keeping tension on the rope) and press the hoist UP push button. Guide the rope, while pressing the UP push button, to smoothly and evenly spool the wire rope onto the drum.

WARNING

Never place your hand or fingers between the UP limit bar and the hoist drum.

8. When the wire rope is properly spooled onto the drum, the cableweight and hook should hang just below the UP limit bar.

NOTE: Never allow the wire rope to unspool leaving less than three wraps of wire rope on the drum.

Chapter 7
Periodic Maintenance

This chapter will cover the periodic maintenance for Beta Max portable hoists.

7.1 Motor

Beta Max, Inc. portable hoists are powered with either a 110V AC electric motor or a 220V AC, single- or three- phase, electric motor depending on the model and customer choice. The motor is fan cooled and all electrical components are sealed and protected from the weather. No motor end user maintenance should be required. In the event of a motor failure or other major malfunction, contact Beta Max, Inc. for assistance.

7.2 Brake

Conical Brake Operation

A fail-safe, conical braking system provides safe load handling at any lifting position and securely holds the load even when electrical power is lost. This system operates from the inductive forces in the rotor created by the AC current through the stator wires.

When voltage is applied to the rotor, the induced magnetic force compresses the tension spring and pulls the brake free from the brake end cap and allows the hoist motor to turn. Conversely, when the magnetic force is absent, the brake is pushed back into the brake end cap by the force of the tension spring and holds the workload securely. Brake load holding force is the force applied between the brake surface and the brake end cap, which is a result of the amount of tension on the tension spring. This prevents the load from free-falling or slipping when the hoist is not lifting or lowering.

Brake Adjustment

Through normal hoist operation and wear, the brake may occasionally need adjustment. The reasons for performing adjustment are listed below.

- Hoist will not lift the load from a stopped, suspended position.
- Hoist will operate in the up direction without a load, but will not lift a normal-rated load.
- Without a load attached, hoist will not respond to either the UP or DOWN push buttons when they are pressed.
- A normal-rated load slips downward when the hoist is stopped.

NOTE: Before performing any adjustments, make indicator marks on the unit for reference in the event readjustment is necessary.

If the brake needs adjustment, there are only two adjustments available. One is the tension spring adjustment and the other is the air gap adjustment. The tension spring adjustment controls the amount of force applied to press the brake into the brake end cap and provides load-holding ability. The air gap adjustment sets the distance between the rotor and the motor brake end cap. The correct air gap setting is important because it has a direct influence on the magnetic force required to pull the brake away from the motor brake end cap. If the gap is too great, the magnetic force will be too weak to disengage the brake and the load will not move. If the gap is too little, the magnetic force will be too strong and the load may not stay in place when the hoist is stopped.

Air gap and tension are two separate adjustments, yet interrelated. This means a change in one will affect the other. As an example, if the air gap is over 0.30 inches (7.62 mm) and the tension adjustment locknut is excessively tightened, the magnetic force cannot overcome the tension across the large air gap, and the brake will not release.

General Adjustment Guidelines

As a general guideline for reference, there should be about three threads showing in the motor brake end cap when the outer air gap adjustment ring is turned in. The end of the tension shaft should barely protrude through the tension adjustment locknut by no more than 1/8 inch (3.2 mm).

Adjusting the Spring Tension

To **increase** the spring tension, turn the tension adjustment locknut (6) counterclockwise.

To **decrease** the spring tension, turn the tension adjustment locknut (6) clockwise.

NOTE: The tension adjustment locknut (6) has left-handed threads.

Adjusting the Air Gap

The nominal recommended air gap is 0.025 inches (0.635 mm). When adjusting the air gap, the rotor (1), bearing (9), and bearing locknut (10) move in or out as the adjustment is being made. However, the tension pin (2), tension spring (3), tension shaft (4), washer (5), tension adjustment locknut (6), and brake (7) all remain fixed in reference to the motor brake end cap (11).

To Increase Air Gap (Decrease Brake Tension)

9. Loosen the three hex head screws (14).
10. Turn the outer air gap adjustment ring (12) clockwise.
11. Tighten the three hex head screws (14).

To Decrease Air Gap (Increase Brake Tension)

1. Loosen the three hex head screws (14).
2. Turn the outer air gap adjustment ring (12) counterclockwise.
3. Tighten the three hex head screws (14).

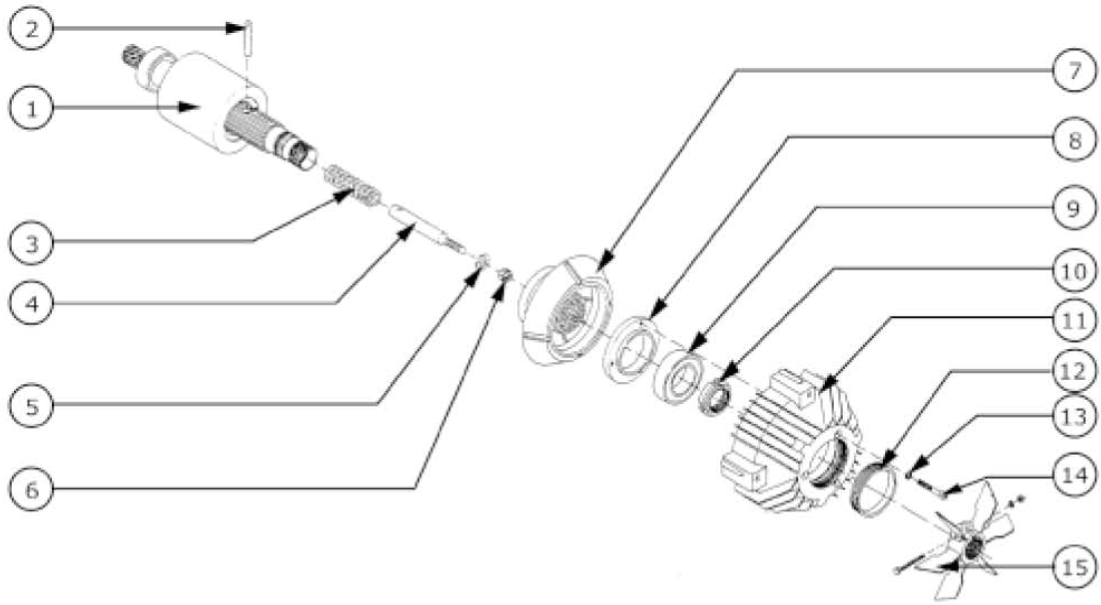


Figure 7.1

Conical Brake Exploded View

Table 7.1 Brake Components

Item	Description
1	Rotor
2	Tension Pin
3	Tension Spring
4	Tension Shaft
5	Washer
6	Tension Adjustment Locknut
7	Brake
8	Inner Air Gap Adjustment Ring
9	Bearing
10	Bearing Locknut
11	Motor Brake End Cap
12	Outer Air Gap Adjustment Ring
13	Lock Washer (3)
14	Hex Head Screw (3)
15	Cooling Fan

Adjusting Brake without Previous References

Begin by adjusting the motor brake by following the procedures as described in **Brake Adjustment**, then proceed as follows.

1. Loosen the three hex head screws (14).
2. Turn the outer air gap adjustment ring (12) counterclockwise about one turn.
3. Tighten the three hex head screws (14) equally in small increments.
4. Continue tightening the three hex head screws (14) until the outer bearing surface (9) comes in contact with the inner side of the outer air gap adjustment ring (12). The air gap clearance at this point should be zero.
5. Increase the air gap by turning the outer air gap adjustment ring (12) clockwise in small 1/8 - 1/4 turn increments until the hoist works properly.
6. Once the hoist operates correctly, turn outer air gap adjustment ring (12) another 1/8 turn.

7.3 Transmission and Drum

The gear reduction assembly for the transmission is maintenance-free and permanently lubricated. Check unit monthly for leaks or damage and have inspected annually by a factory service center.

7.4 Wire Rope

Periodic maintenance of the wire rope is important to ensure long rope life and smooth hoist operation. The rope should always have lubricant present and not become dry to the touch. Inspection for wire rope lubrication should be performed daily and, if needed, apply the recommended lubricant. Beta Max, Inc. recommends using 90W gear lube generously (not dripping) applied with a shop towel.

WARNING

Always wear heavy gloves when handling the wire rope to prevent possible hand injury. Never place hand between UP limit bar and drum.

Beta Max, Inc. recommends wire rope annual inspections by authorized service personnel for overall service conditions. If wire rope diameter at any time measures less than 3 percent of the original size, wire rope must be discarded and a new rope installed.

WARNING

If the usability or integrity of the wire rope is ever in question, replace the wire rope immediately to avoid possible personal injury or potential equipment damage.

WARNING

Never use a rope that has become knotted. It is unusable at this point and should be discarded.

Chapter 8
Troubleshooting

Beta Max portable hoists are designed to operate consistently and trouble-free. In the event the hoist does not operate or operates inconsistently, the following troubleshooting guide will aid in correcting the problem.

CAUTION

Before attempting to troubleshoot the portable hoist, read and understand all the information in the Safety section.

Table 8.1

Problem	Possible Cause	Solution
Hoist will not operate when pressing either the UP or DOWN push buttons; hoist motor makes no sound.	No electrical power, LED not lit.	Check all circuit breakers, fuses, and electrical cord connections to ensure all are functioning properly and are not damaged.
	Unit has been used continuously for more than 20 minutes and has exceeded the recommended 50 percent Duty Cycle.	Allow motor to cool for 20 minutes before using.
Hoist makes excessive vibrating noise.	Wire rope has come off the drum.	Check the wire rope to ensure it is properly spooled onto the drum.
	Brake fan blade broken.	Inspect brake fan.
	Nuts and bolts securing the shroud and housing have come loose.	Check all nuts and bolts and tighten if needed.

Table 8.1

Problem	Possible Cause	Solution
Hoist operates in the down direction but will not go up.	Upper limit switch problem.	Check circuit breakers, fuses, and electrical cord connections to ensure all are functioning properly.
	Pendant wiring problem.	Try operating hoist with another pendant.
Hoist will not lift the load from a stopped, suspended position; motor clicks and hums.	Power source problem.	Check for correct voltage at the motor with the hoist loaded and lifting.
	Brake needs adjustment.	Adjust the brake.
	Load is heavier than the rated maximum for the model being used.	Reduce the weight of the load.
	Capacitor damage or capacitor malfunction.	Test capacitors and replace if needed.
Hoist operates in the up direction without a load, or with a small load, but will not lift a rated load.	Power source problem.	Check for correct voltage at the motor with the hoist loaded and lifting.
	Brake needs adjustment.	Adjust the brake.
	Load is heavier than the rated maximum for the model being used.	Reduce the weight of the load.
	Capacitor damage or capacitor malfunction.	Test capacitors and replace if needed.

Table 8.1

Problem	Possible Cause	Solution
Hoist lifts the load when pressing the DOWN push button and lowers the load when pressing the UP push button.	Wire rope has been incorrectly spooled onto the drum. Switch wired incorrectly.	Check and/or correct the spooling direction of the wire rope. Check for correct wiring of all electrical switches.
Stopped, suspended load goes down when pressing the UP push button.	Load is heavier than the rated maximum for the model being used. Capacitor damage or capacitor malfunction.	Reduce the weight of the load. Test capacitors and replace if needed.
Without a load, hoist will not operate when pressing either the UP or DOWN push buttons; motor hums.	Brake needs adjustment. Capacitor damage or malfunction. No electrical power, LED not lit.	Adjust the brake. Test capacitors and replace if needed. Check all circuit breakers, fuses, and electrical cord connections to ensure all are functioning properly and are not damaged.
A normal rated load slips downward when hoist is stopped.	Brake needs adjustment.	Adjust the brake.
Hoist will lift a normal rated load but will not lower the same load. Hoist will lower a normal rated load but will not lift the same load.	Possible control pendant switch and/or pendant cable damage.	Repair/replace the control pendant switch and/or cable assembly. Check the electrical wiring of all switches for damage.

Table 8.1

Problem	Possible Cause	Solution
Control pendant switch push buttons do not have the distinct “click” sound when pressed.	Control pendant switch and/or push buttons are damaged.	Repair and/or replace the control pendant switch.
Load starts and stops while hoist is lifting; hoist lifting action is jerky and not smooth.	Load is being lifted at an angle, or a tag line is being used, and wire rope is dragging against the upper limit bar. Upper limit bar is bent.	Position the load directly below the hoist and lift straight up. Never pull or drag the load from the side. DO NOT USE TAG LINES!! Repair or replace the upper limit bar if needed.
Hoist does not stop when the headache ball (cable weight) contacts the upper limit bar.	Upper limit bar assembly linkage is damaged. Upper limit switch assembly is either bypassed or damaged.	Repair and/or replace the upper limit bar assembly linkage. Repair and/or replace the upper limit switch electrical assembly.
Wire rope is not tracking evenly on drum.	Unit is not level vertically and horizontally. A tag line is being used.	Level the hoist using an accurate bubble level. DO NOT USE TAG LINES!!

Chapter 9
Accessories

This chapter will cover the accessories available for Beta Max portable hoists.

9.1 Hoist Lifting Accessories

Beta Max, Inc. offers a wide range of lifting accessories to accommodate many specialized lifting demands.

Brick Fork

400-pound (182-kg) capacity

Maximum brick size: 2-1/2” x 3” x 8”

Dimensions: 29-1/4” L x 7-1/2” W x 37-1/2” H

Block Fork

800-pound (363-kg) capacity

For lifting 8” x 8” x 16” block

Dimensions: 24-1/2” L x 24-1/2” W x 34-1/2” H

Scaffold Frame Fork

600-pound (272-kg) capacity

Dimensions: 36-1/4” L x 15” W x 25” H

Holds 10 scaffold frames

Basket with Spreader Bar

400-pound (182-kg) capacity

Dimensions: 30-3/4” L x 20-3/4” W x 12-1/4” H

800-pound (363-kg) capacity

Dimensions: 36-3/4” L x 36-3/4” W x 18-1/2” H

Brick Tray with Spreader Bar

400-pound (182-kg) capacity

Dimensions: 29” L x 20” W x 20-1/2” H

Dumpster Bucket

Easy to empty, swivels through 360-degree arc

Available in 24-, 31-, or 40-gallon capacity

Wheelbarrow Sling

Regular - 400-pound (182-kg) capacity

Heavy duty - 800-pound (363-kg) capacity

Fits standard wheelbarrows

Spreader Bar

Perfect for lifting buckets or cross braces

Mud Tub

1/4-yard capacity - Dimensions: 42” L x 27” W x 18” H

1/3-yard capacity - Dimensions: 42” L x 27” W x 28” H

Double Rope Kit

A rugged pulley and hook assembly designed for units with double rope capabilities

Counterweight Clamp Assembly

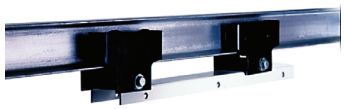
Easily attaches to Trestle Monorail and Scaff-Trac systems with tubular clamps.

Use with 50-pound (23-kg) suspended staging counterweights

9.2 Mounting Top Accessories

Below are examples of available hoist mounting tops for attaching the portable hoist to a variety of scaffolding types.

I-Beam Trolley Top

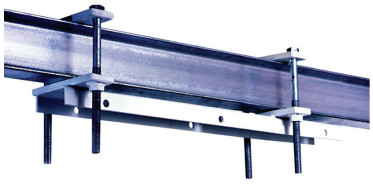


Provides the ability to easily move the hoist and workload from the lifting point to the work area

Rollers are permanently sealed and are maintenance-free

Adjustable to fit flange widths from 2.66 inches to 4.66 inches (6.75 cm to 11.83 cm)

Fixed I-Beam Top



Bolts to an existing I-Beam and prevents hoist from moving

Use where a fixed hoist position is desired

M80 Roller Top

Allows the hoist to be moved from the lifting point to the work area

Designed for use on Scaff-Trac, Mac-Trac, and Trestle/Monorail

9.3 Electrical Accessories

Beta Max, Inc. also offers several electrical accessories to meet additional job needs and requirements.

Remote Control Extension

Attaches to the pendant assembly to extend the working range from the hoist

Quick disconnects attached to both ends

Available in 25-foot (7.6-meter) and 85-foot (25.9-meter) lengths

Booster Transformer

For use when power supply cable needs exceed 100 feet (30.5 meters)

Available for 110V AC or 220V AC

Dual Control Package

Allows connecting two pendant assemblies together for the same hoist

Gives the flexibility for two operators to control hoist operations

Pendant Assembly

Push button control, with a quick disconnect, for raising and lowering the workload

Attached 6-foot electrical cable

Power Cord Extension

110V AC or 220V AC

Available in custom lengths

Wireless Dual Control Package

Allows remote hoist operation from 400 to 500 feet (122 to 152 meters) away

Chapter 10
Parts

This chapter will cover the parts used on Beta Max portable hoists

10.1 Brake Components

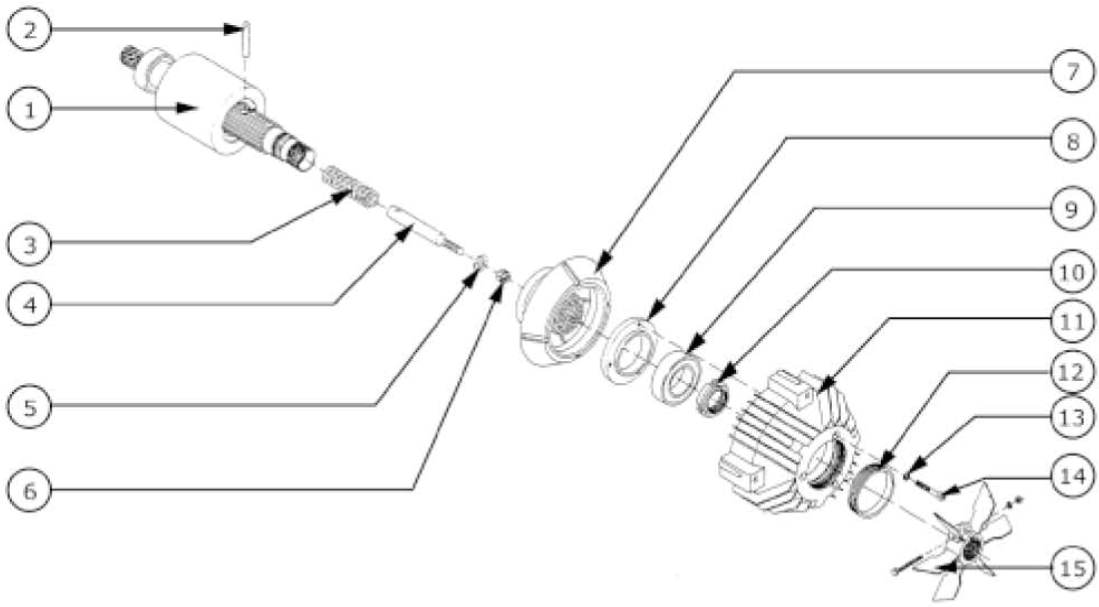


Figure 10.1

Brake Components

Table 10.1 Brake Components

Item	Description
1	Rotor
2	Tension Pin
3	Tension Spring
4	Tension Shaft
5	Washer
6	Tension Adjustment Locknut
7	Brake
8	Inner Air Gap Adjustment Ring
9	Bearing
10	Bearing Locknut
11	Motor Brake End Cap
12	Outer Air Gap Adjustment Ring
13	Lock Washers (Three)
14	Hex Head Screws (Three)
15	Cooling Fan

10.2 Transmission and Drum Components

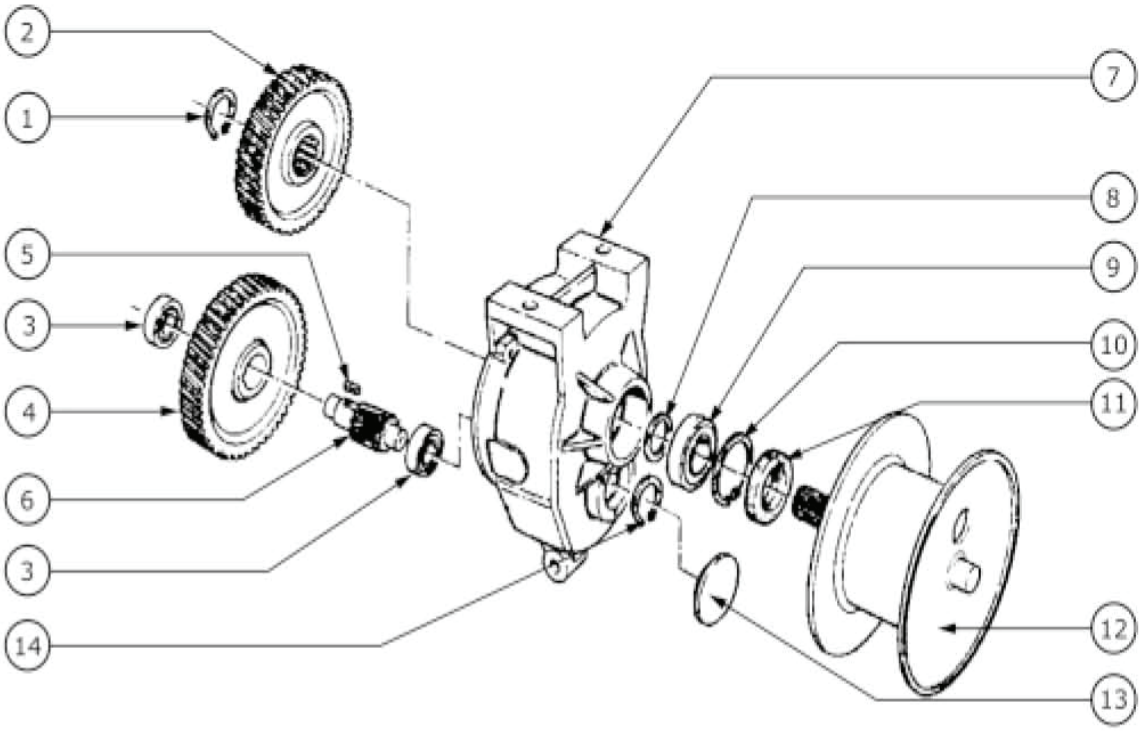


Figure 10.2

Transmission and Drum

Table 10.2 Transmission and Drum

Item	Description
1	Retaining Ring
2	Cogged Wheel
3	Bearing
4	Cogged Wheel
5	Key
6	Intermediate Shaft
7	Shell
8	Spacer
9	Bearing
10	Retainer Ring
11	Oil Seal
12	Drum
13	Stopper
14	Retaining Ring

10.3 Motor and Brake Assembly

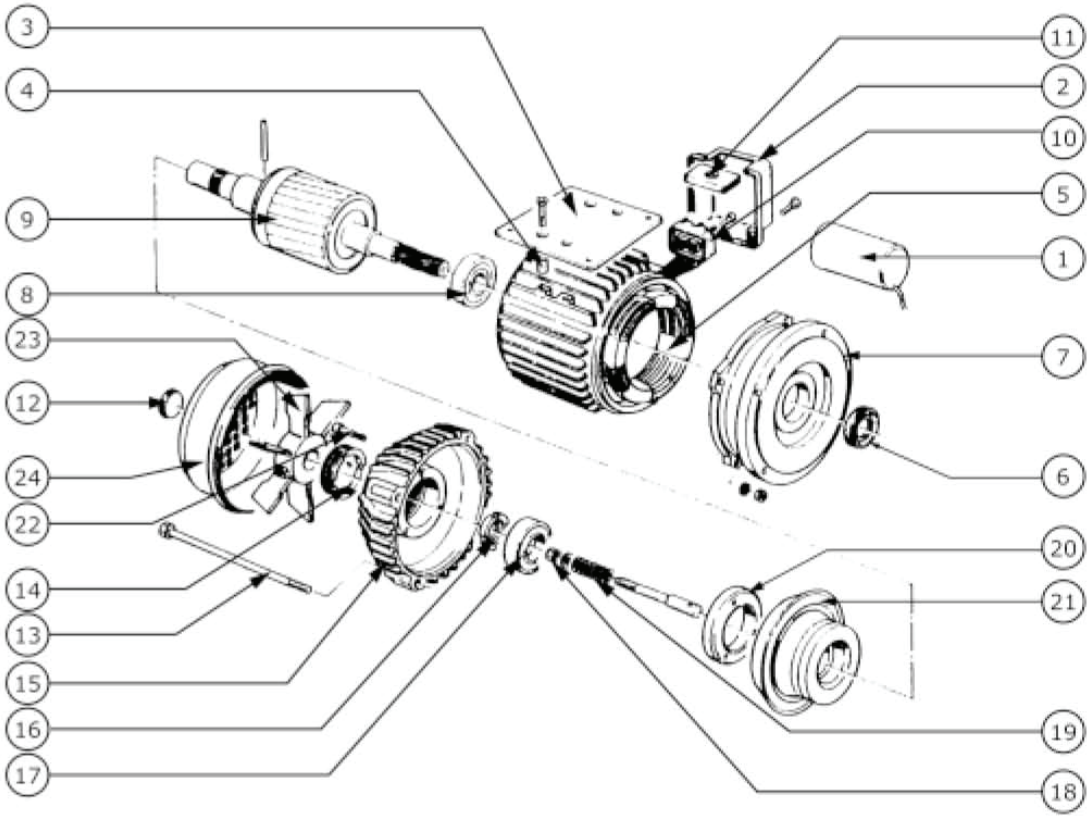


Figure 10.3

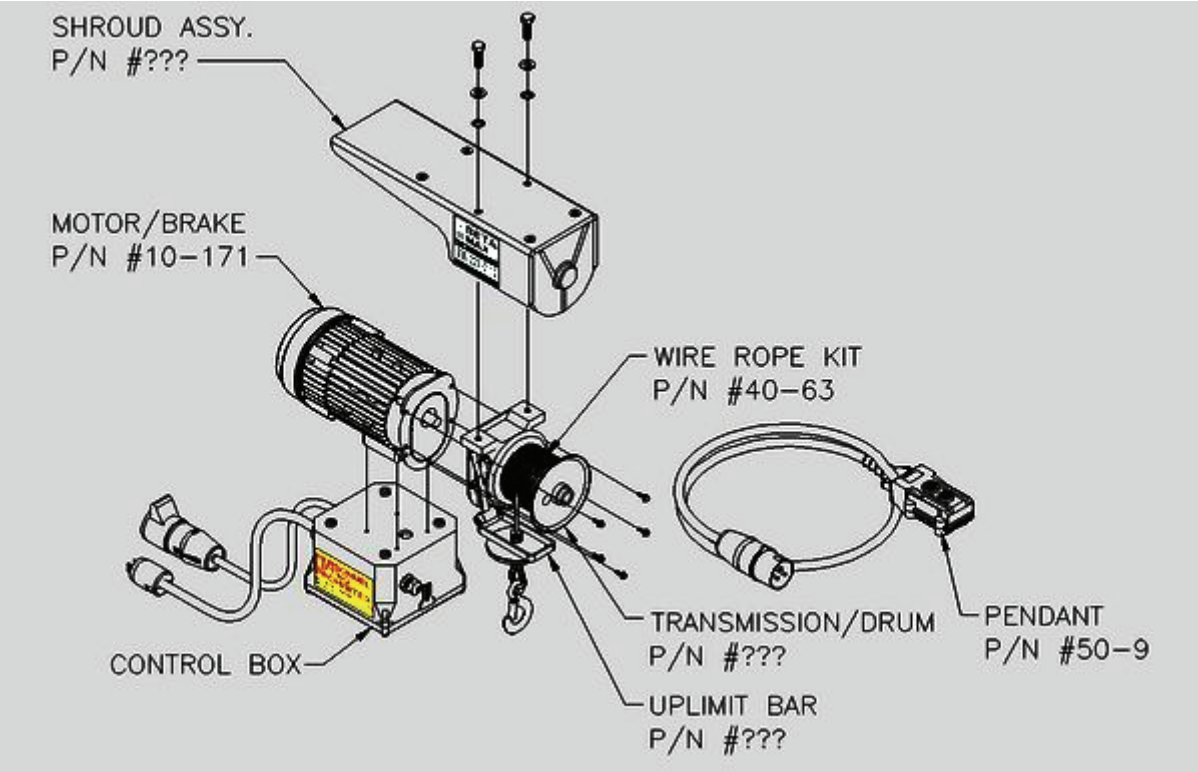
Motor and Brake Assembly

Table 10.3 Motor and Brake Assembly

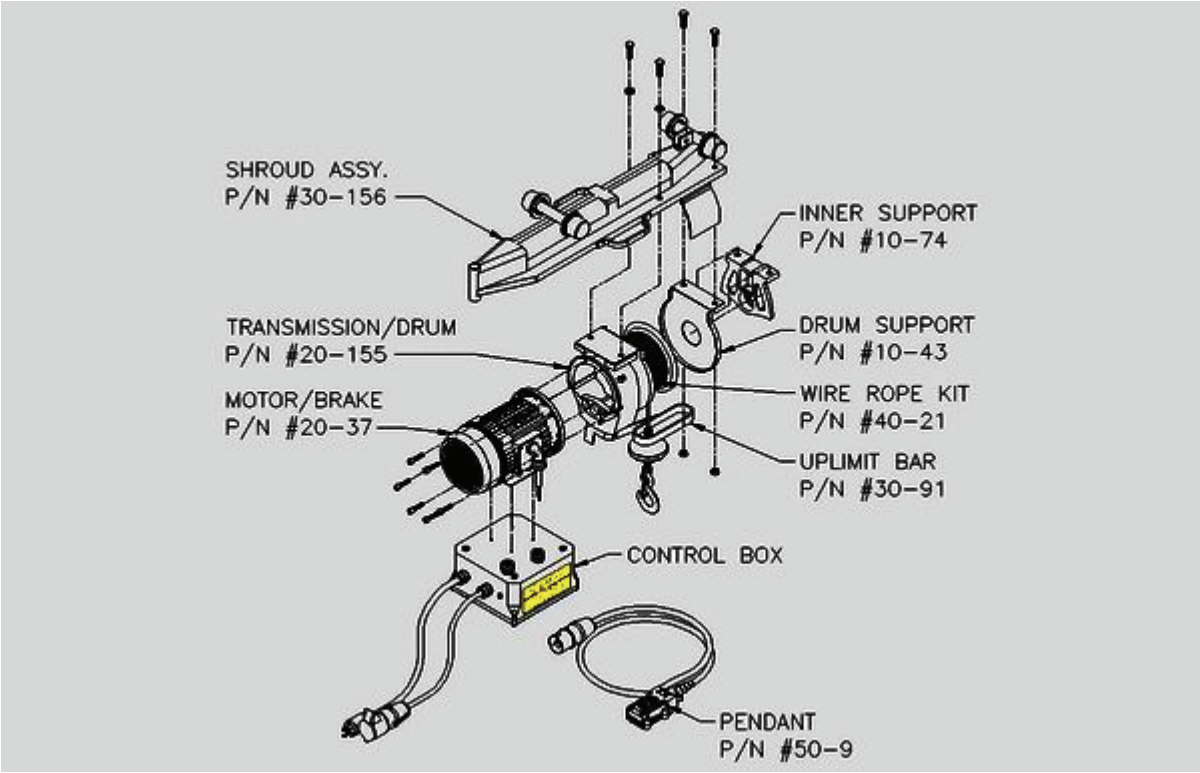
Item	Description
1	Condenser
2	Cable Passage Plate
3	Plate
4	Spacer
5	Packed Casing
6	Oil Splash Guard
7	Inner Flange
8	Front Bearing
9	Rotor Shaft
10	Terminal Unit
11	Terminal Unit Cover
12	Fan Cover Plug
13	Tie Rod
14	Adjusting Ring Nut
15	Rear Shield
16	Auto Locking Nut
17	Rear Bearing
18	Auto Locking Nut
19	Spring
20	Auto Locking Ring Nut
21	Complete Brake Lock
22	Screw
23	Fan
24	Fan Cover

10.4 Parts by Model

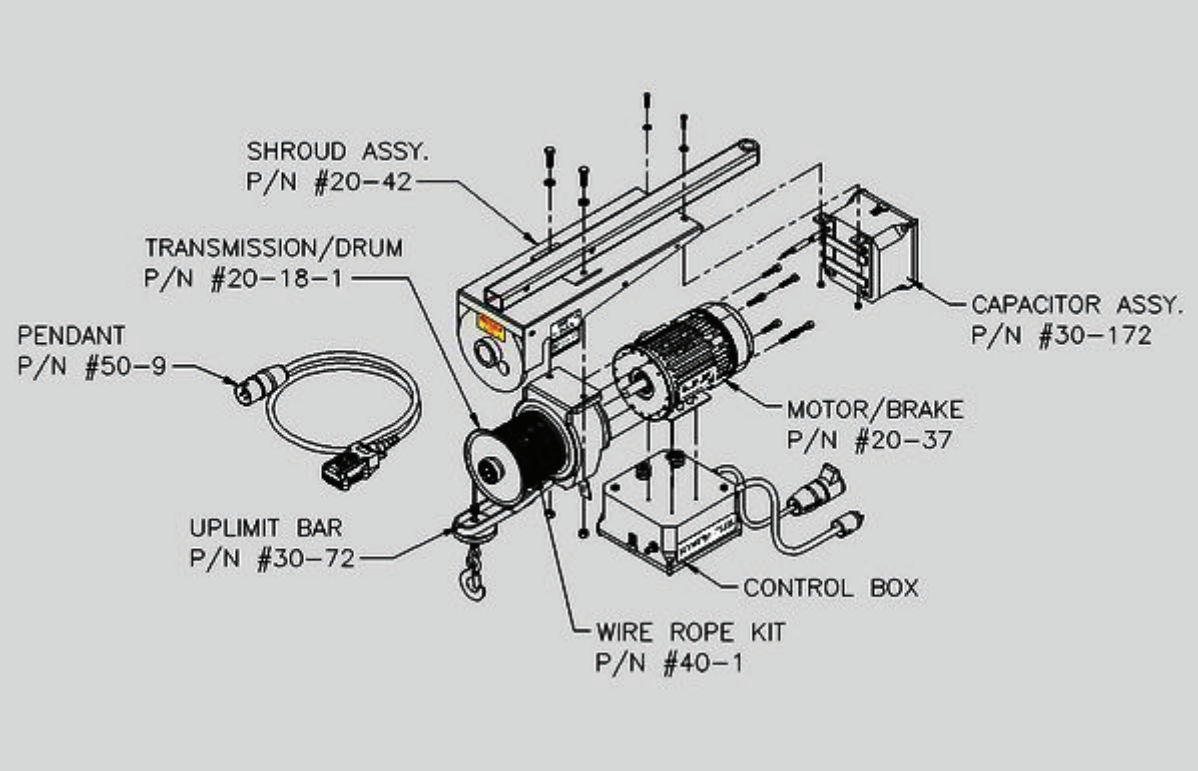
Beta Lite Plus (50-29/50-31)



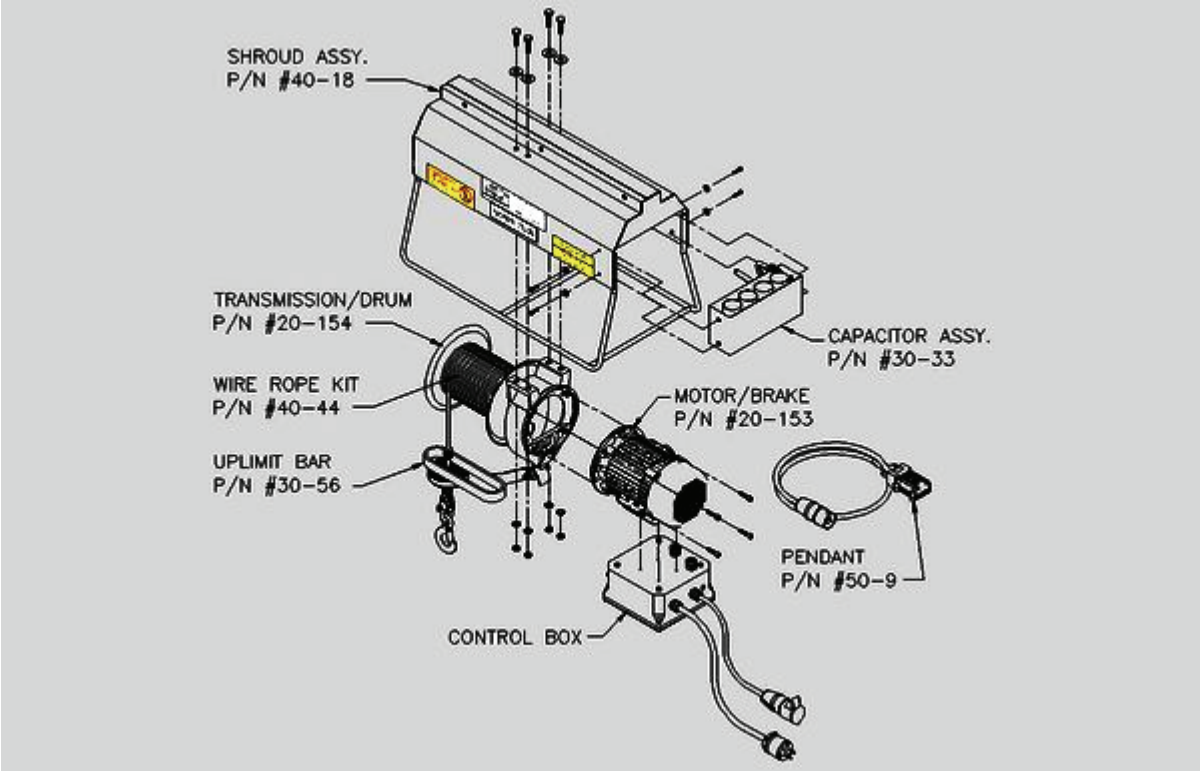
Scorpio Plus (50-34)



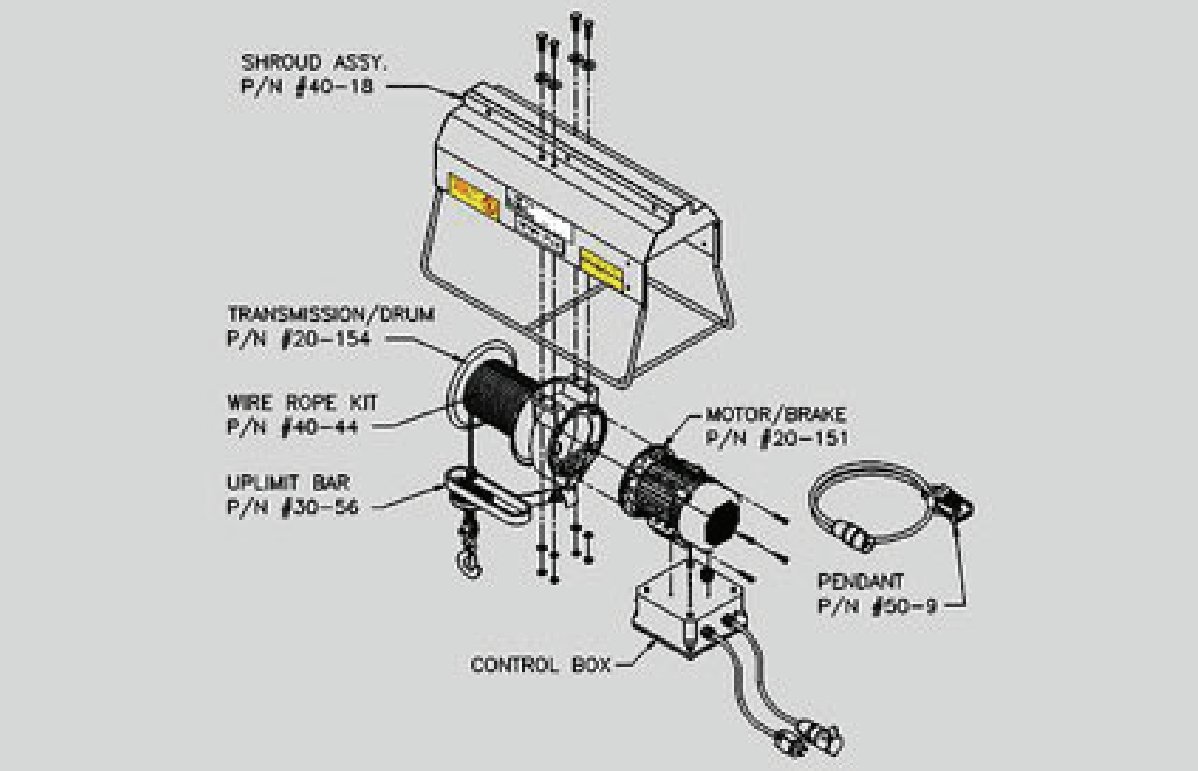
Scorpio Plus XL (50-33-1)



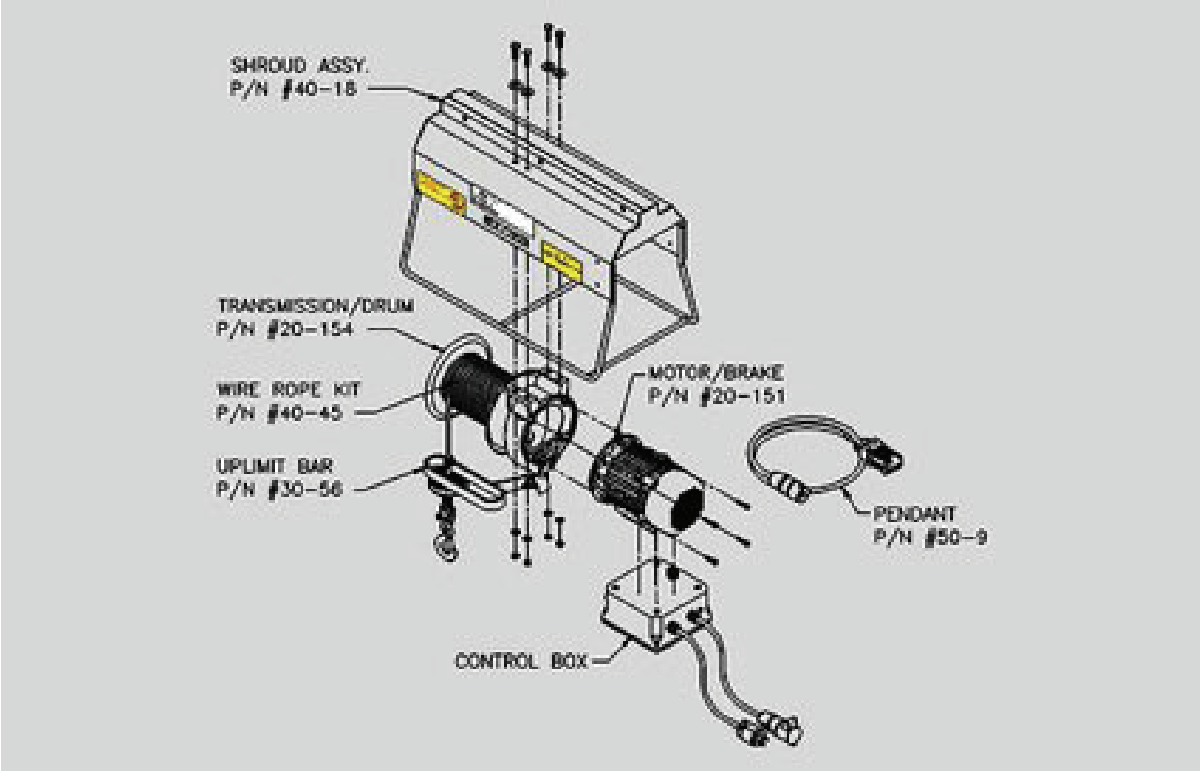
Gemini Plus (50-11)



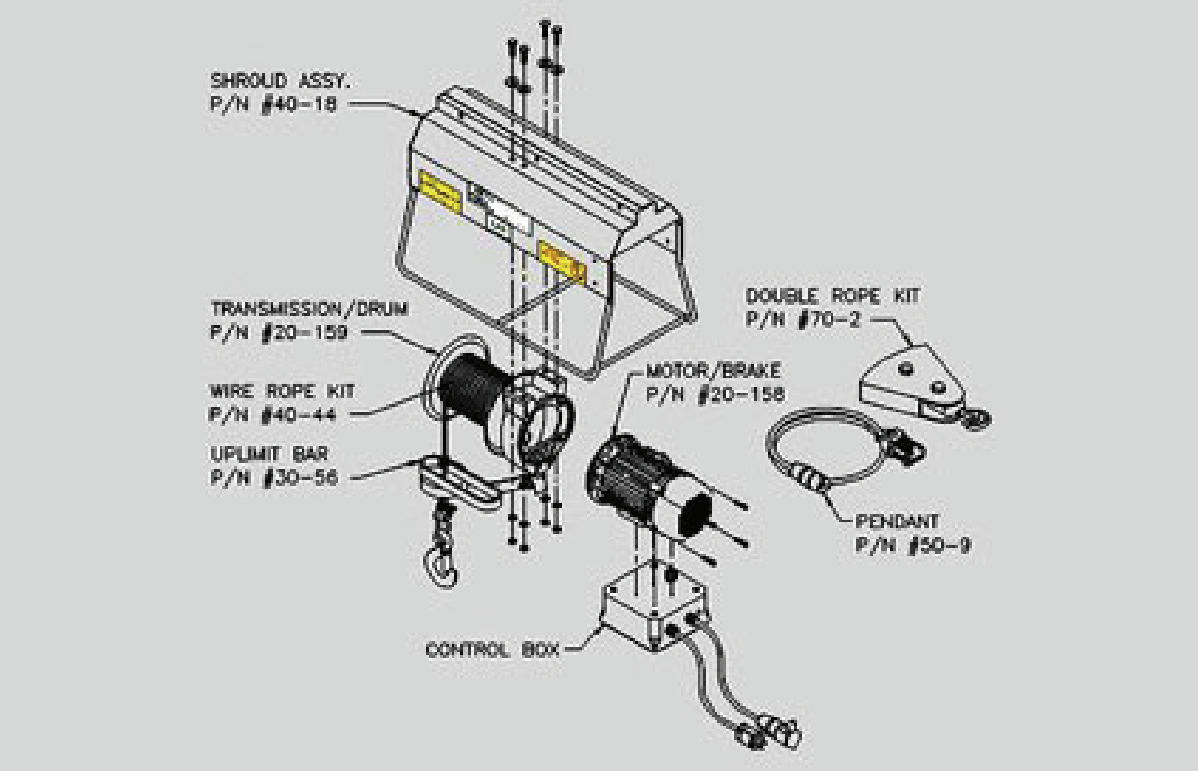
Gemini Plus (50-8)



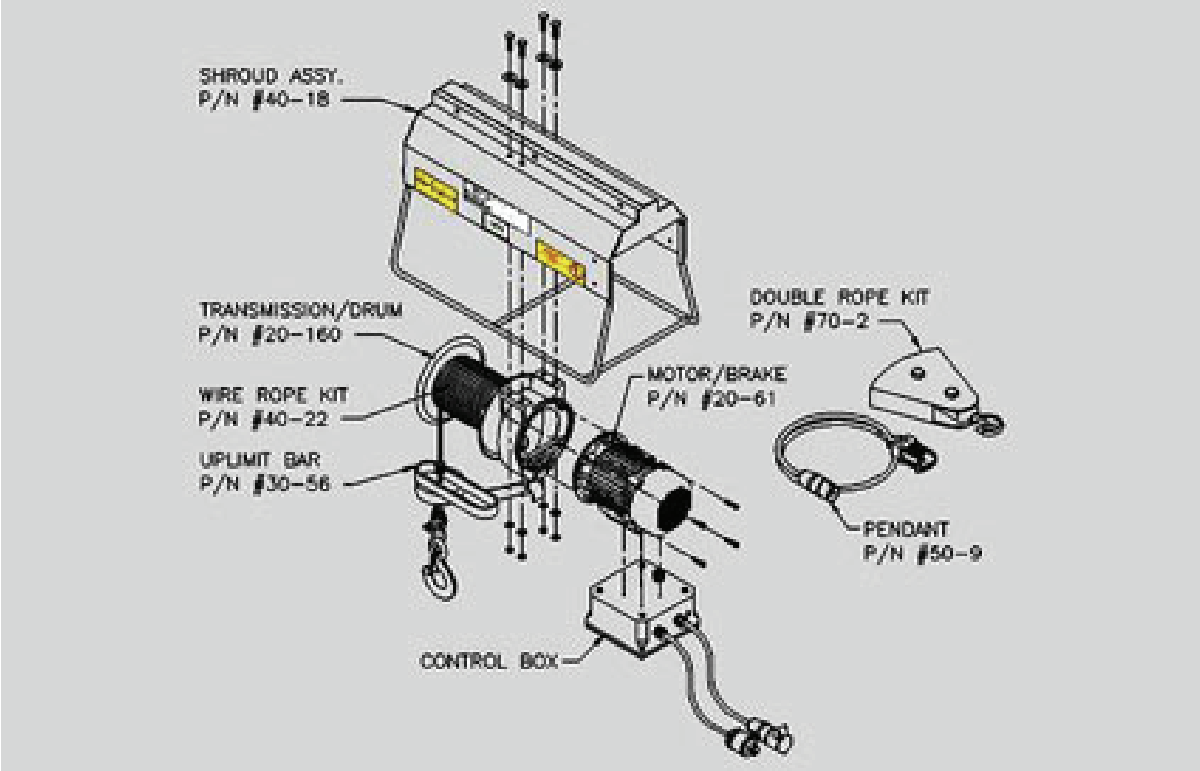
New Yorker (50-18)



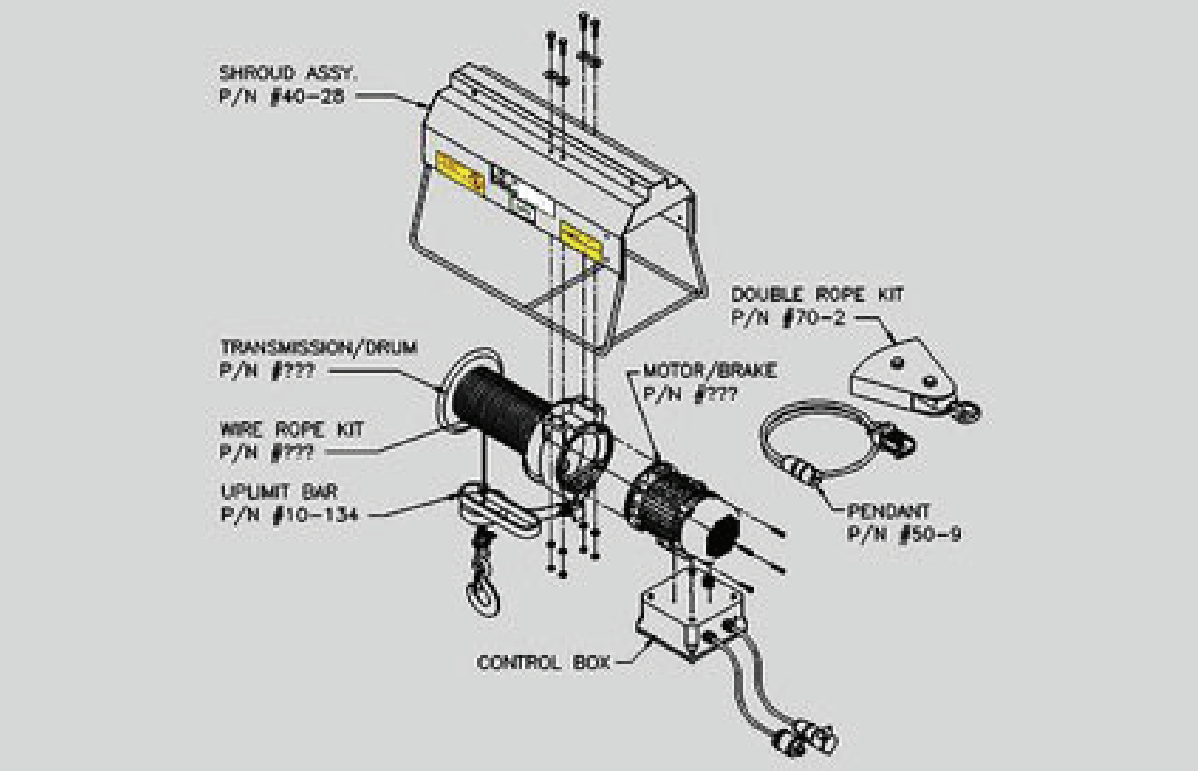
Leo Single-Phase (50-40)



Leo Three-Phase (50-2)



Leo XXL (50-25)


SHROUD ASSY.
P/N #40-28
DOUBLE ROPE KIT
P/N #70-2
TRANSMISSION/DRUM
P/N #???
MOTOR/BRAKE
P/N #???
WIRE ROPE KIT
P/N #???
UPLIMIT BAR
P/N #10-134
PENDANT
P/N #50-9
CONTROL BOX

Chapter 11
Optional Equipment

This chapter will cover optional equipment for Beta Max portable hoists.

11.1 Wireless Remote Control

A wireless remote control option is available as an aftermarket accessory. This option allows hoist operation from two different locations. For example, the hoist could be operated from the hoist itself and from the ground level. The wireless remote control also includes a hand-held transmitter.

The wireless remote control box incorporates one pendant pigtail to connect to the hoist control box pigtail, and two power pigtails. The inside of the wireless remote control box includes a receiver that is linked to the hand-held transmitter.

To integrate the wireless remote control option to an existing standard controlled hoist follow, these steps.

1. Unplug the standard 6-foot operator's pendant.
2. Hang the wireless remote control box on the back side of the hoist shroud using the two hangers supplied with the wireless remote control box.
3. Plug the auxiliary wireless remote control box into the same pigtail using the mating connector.
4. Plug the male power connector on the hoist control box into the female power connector on the wireless remote control box.
5. Plug the male power connector on the wireless remote control box into the power supply.
6. Make sure the hoist is operating by pressing the button on the hand held transmitter.

It is the responsibility of the hoist operator to make sure only one person is operating the hoist at a time. If two operators try to operate the hoist simultaneously, the hoist will automatically stop for a period of time of approximately 10 seconds before allowing any person to operate it. After a time delay of approximately 10 seconds, a single operator may begin operating the hoist again.

11.2 Variable Frequency Drive Controller

Beta Max, Inc. three-phase hoists are also available with a VFD (Variable Frequency Drive) controller. This allows the power and efficiency of a three-phase motor while operating on single- or three-phase power. The VFD controller provides for soft start and stop operation and allows a slow acceleration/ deceleration to avoid shocking the load. The standard configuration has two speeds, pre-set at approximately 35 and 75 feet per minute. Speeds can be customized per request from a minimum of approximately 20 feet per minute. The VFD controller is also available with an integrated wireless remote control.

Chapter 12
Warranty

Beta Max, Inc. warrants its equipment to be free from defects in material and workmanship under normal use and service.

Our obligation under this warranty, as outlined below, is limited to repairing or replacing, at our discretion, any part of the unit which proves, upon examination, to be defective in material or workmanship. The unit is to be returned to Beta Max, Inc. through an authorized distributor. The warranty period, shown below, begins on the date the equipment is sold to the original purchaser.* Any return shipments to Beta Max, Inc. must be prepaid.

High Wear Items:

Wire rope, pulleys, hooks, shackles.....30 days or 1 month

Electrical:

Pendant switches, electrical plugs and cable .....90 days or 3 months

Mechanical:

Motor, brake, wire rope drum, trolley wheels .....1 year

Gears:

Gear reduction drive assembly .....5 years

*For **rental** machines, the Dealer is defined as the Original Purchaser.

*For **resale** machines, the First User is defined as the Original Purchaser.

Any parts proven to be defective, upon inspection, will be repaired or replaced at no cost for the parts. The obligation under this warranty includes labor and freight costs if determined the product failed under normal usage within the described time.

Any defect in this equipment must immediately be brought to the attention of the distributor from whom the unit was purchased. The distributor will make arrangements with the factory for repairs or replacement of parts within the terms of this warranty. Distributors must get a return authorization number from Beta Max, Inc. before any item is returned for repair or replacement.

The obligation of Beta Max, Inc. is limited to replacing parts and does not include replacing the complete unit. This warranty is void on any unit that has been modified or tampered with, repaired by persons other than a factory representative or an authorized Beta Max distributor, repaired with other than Beta Max standard parts, or damaged by reasons of accident, alteration, misuse, or abuse.

This warranty is in lieu of all other warranties expressed or implied. We do not authorize any person or representative to make any other guarantee or to assume for us any liability in connection with the sale of our products other than those contained herein. Any agreement outside of, or contradictory to, the foregoing shall be void and of no effect.

NOTES