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DESCRIPTION

In 1990 Beta Max, Inc. introduced a portable track hoist system, or "ladder" hoist as it is sometimes called because of its ladder-like appearance. This new product is being employed by scaffolding companies, utilities, processing plants, and a variety of commercial companies for applications ranging from boiler repair, building construction and maintenance, to temporary lifting requirements within industrial environments. For these customers, the track hoist represents a safer and more productive way to erect and dismantle scaffolding, a cost-effective material lifting solution on long-term construction jobs, and a flexible material handling system for a variety of interior and exterior settings.

Beta Max, Inc. products provide more value and flexibility for most low end lift applications than heavy lifting equipment, and are safer and more productive than the "human chain" manual method.

The Beta Maxial track hoist system has the following characteristics:

- Strong, lightweight - 3lbs. per foot - aluminum track sections that are simple to assemble using unique components called Kwik bolts.
- Upper and lower limit switches, integrated to the winch, that automatically sense when the load reaches the top and the bottom respectively, and turn the motor off.
- An automatic safety brake mechanism on the universal carriage that stops the entire load within seconds in the unlikely event of broken cable.
- Both a mechanical and electrical overload feature that prohibits workers from attempting to lift more than 450 lbs..
- A broad range of accessories that enable the Beta Maxial track hoist system to improve productivity, safety, and ease of work in the following construction applications:
    - Roofing
    - General building / construction
    - Scaffold erection and dismantling
    - Tiling
    - Plastering
    - Carpentry
    - Insulation installation

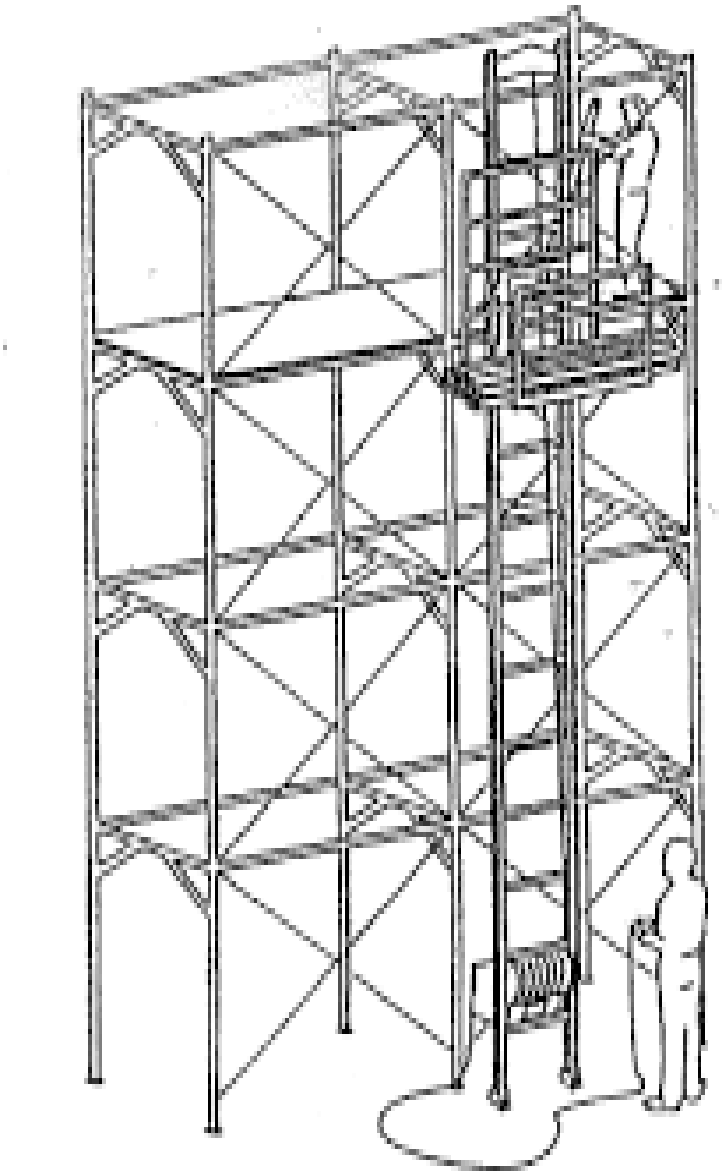
SPECIFICATIONS

The Beta Maxial track hoist can reach any working height up to 350 feet by fitting together modular track sections that are available in 9’ 9”, 6’ 6” and 3’ 3” sections. A variety of attachments are available to lift different kinds of loads, from modular or frame scaffolding to roofing or sheeting materials. A maximum weight of 450 lbs. can be lifted in one load.

Winch	115 volt, 1.0 hp., single phase, fully enclosed, fan cooled, ~70% duty cycle 110 DC brake on motor shaft.
Control Box	24 volts A.C., overload sensing device - up and down contactors, power overload, up and down limit lights, fuses, heavy duty industrial grade connectors.
Pendant Control	Up and down, emergency stop and raise buttons.
Track Sections	9’ 9”, 6’ 6” and 3’ 3” lengths.
Maximum Height	350 ft.
Maximum capacity	450 lbs.
Wire Rope Size & Drum Capacity	350’ with 3/16” galvanized aircraft cable or 250’ with 1/4” galvanized aircraft cable.
Power Cord Extension Size & Length	10/3 SO cord up to 100 ft.and 8/3 SO cord up to a maximum of 150 ft.

MOUNTING OPTIONS

The track hoist is typically mounted in a vertical Position when used with scaffolding. The hoist may be erected on the outside of the scaffold for easy access to the lift equipment, or within the scaffolding bay to facilitate offloading of the carrier at elevated locations.



ELECTRICAL DESCRIPTION

The hoist is powered by a 115V AC motor of approximately 1 HP driving a 36 to 1 gear reduction that provides a single rope lifting capacity of 600 lbs. at approximately 65 - 70 FPM. Note that net capacity of 450 lbs.= 600 lbs. minus carriage and carrier. The motor is capacitor start and capacitor run type and uses about 300 mf capacitance for start and 80 mf capacitance for run. A centrifugal switch in this motor opens when the motor reaches its operating speed of 1750 RPM. The switch opening deenergizes a contactor therefore removing the 300 mf start capacitance from the motor windings. The motor has 2 windings with one end of each connected together and the start and run capacitor across the other 2 ends. The windings have different DC resistance and are used in this manner:

When the UP winding is directly across the 115V AC supply and the DOWN winding is in series with the capacitors, the phase shift makes the hoist turn in the UP direction, reeling in wire rope. The current drawn in this UP direction is about 13 amps for no-load when volts are 115. The current will increase to about 15 amps for full load. When the motor initially starts it draws what we call locked rotor or stalled current, which is about 40 amps. When the DOWN winding is directly across the 115V AC supply and the UP winding is in series with the capacitors, the phase shift makes the hoist turn in OUT direction reeling out wire rope. The current drawn in the DOWN direction is about 3 to 4 amps at 115 volts for no-load. The current will increase to 5 to 6 amps when lowering a full load. This is because it takes energy to hold the load back from falling. Again, the initial starting current for the down direction is also higher.

Remember voltage decreases or is dropped across the power cord as current increases and current carrying capacity is proportional to the size of the conductors. When longer wire runs are necessary the supply wire size should increase up to 8 and 6 gauge. The gear reduction has a 115V DC brake on the low torque shaft end of the motor outside the gear box. A friction disc sandwiched between the winch side plate and the DC brake disc rides on a star gear to allow for alignment. The star gear is keyed to the motor shaft. When the DC brake magnet is not magnetized, no DC current, a series of springs push the fixed brake plate against the friction disc and then against the winch side plate, stopping the motor.

Other components of the hoist assembly are the upper limit switch at the bottom of the hoist and slack rope or down limit switch at the top of the unit.

The following two connections are made to the hoist through a heavy duty keyed connector:

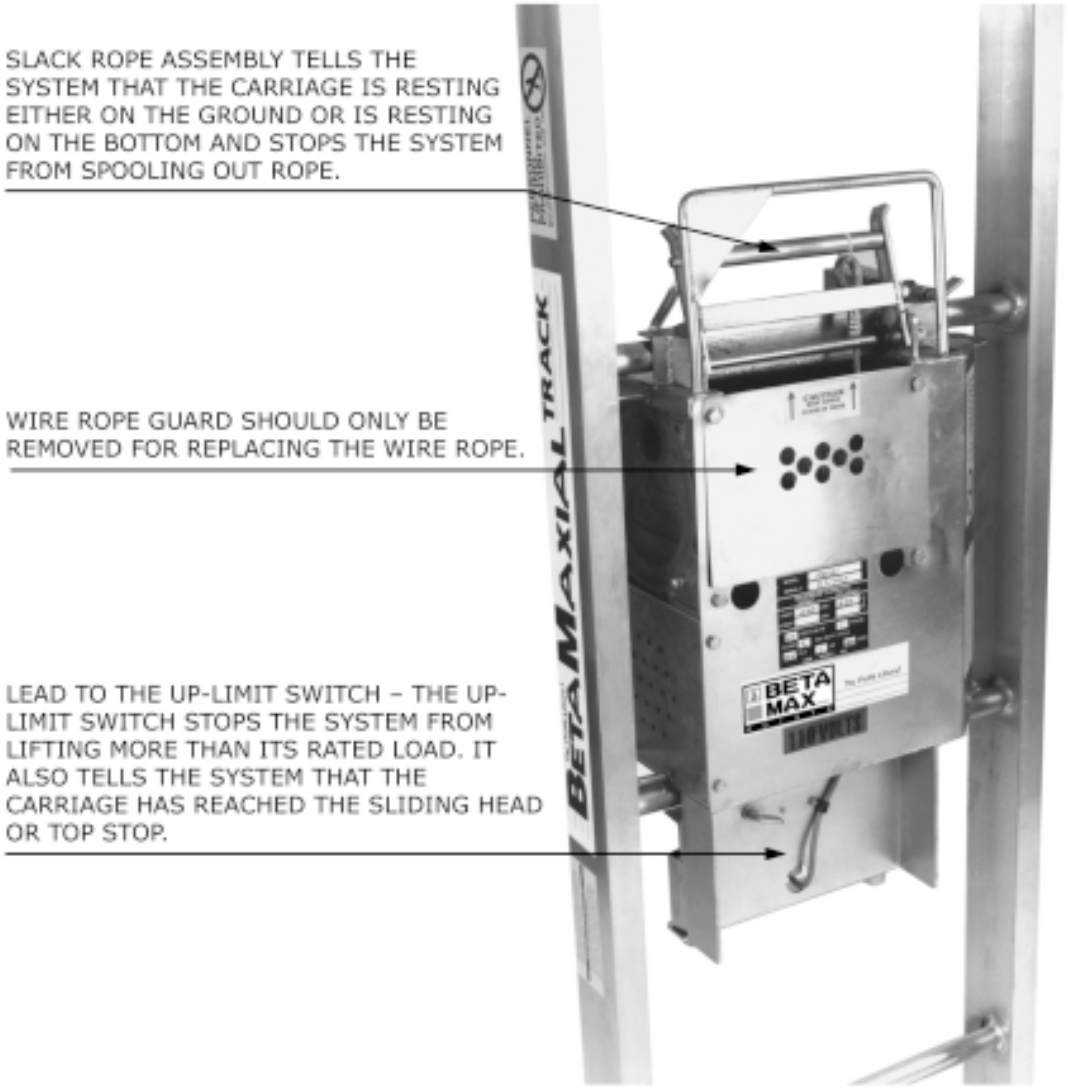
PIN	DESCRIPTION
1	AC for up to motor
2	AC common to motor
3	AC for down to motor
4	Centrifugal switch in motor
5	DC brake
6	Down limit switch
7	Centrifugal switch in motor
8	UP limit switch
9	24 V AC Common to limit switches
10	DC brake
11	Frame ground

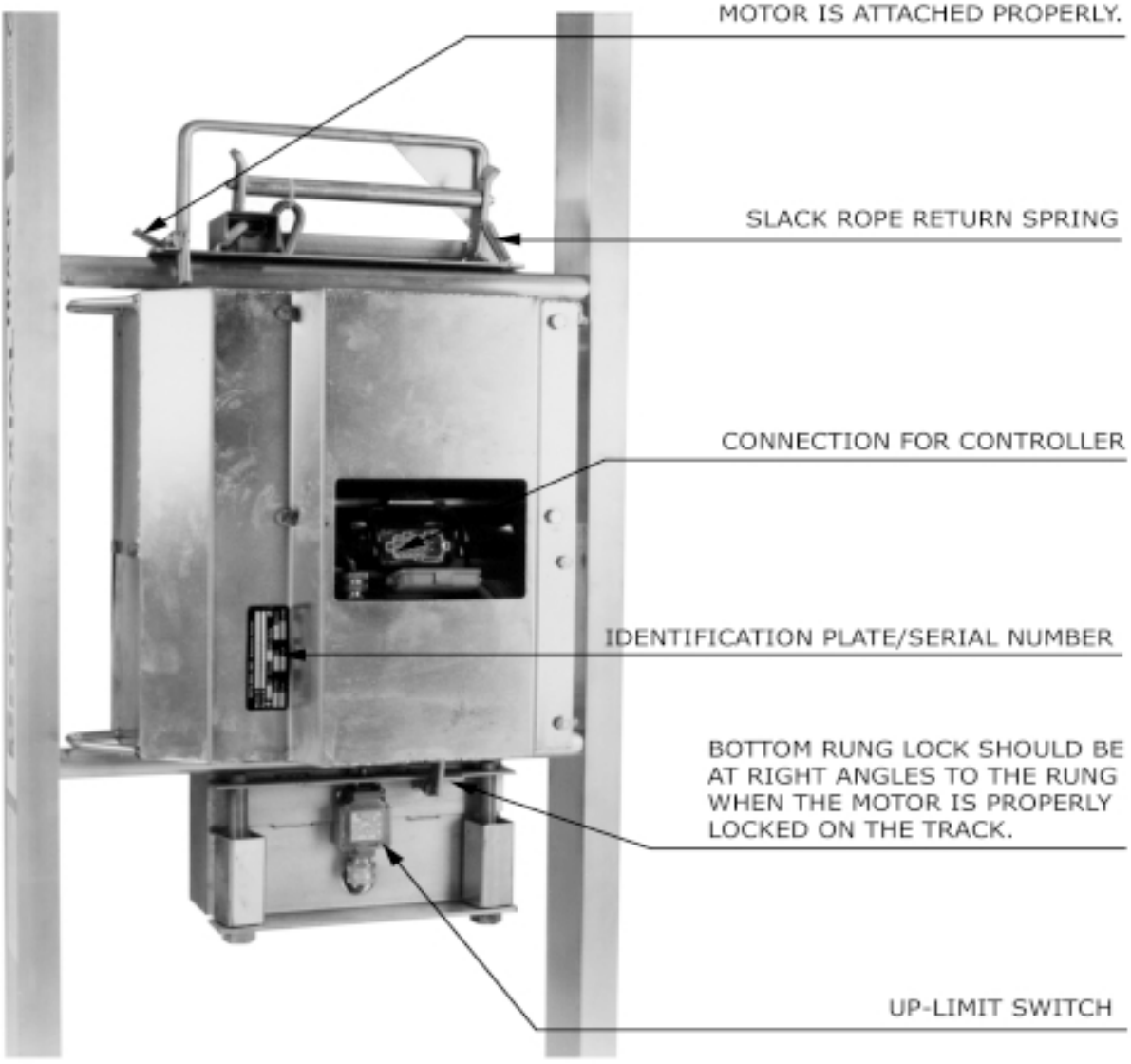
The slack rope or down limit circuit in the controller uses the normally closed contacts on the switch then when the bar is pulled away from the switch by the wire rope there should be a short or 0 ohms resistance between Pin 6 & 9.

The UP limit circuit in the controller uses the normally closed contacts on the switch, therefore there should be a short or 0 ohms resistance between Pin 9 & 8 with no-load on the winch. When the hoist is lifted up by its own power as the carriage hits the rubber bumpers on the sliding head after overcoming the spring resistance then an up limit or overload condition occurs because there is no connection between Pins 9 & 8.

BETA MAXIAL HOIST UNIT

PART # 80-5




TOP RUNG LOCK SHOULD BE AT RIGHT ANGLES TO RUNG WHEN MOTOR IS ATTACHED PROPERLY.
SLACK ROPE RETURN SPRING
CONNECTION FOR CONTROLLER
IDENTIFICATION PLATE/SERIAL NUMBER
BOTTOM RUNG LOCK SHOULD BE AT RIGHT ANGLES TO THE RUNG WHEN THE MOTOR IS PROPERLY LOCKED ON THE TRACK.
UP-LIMIT SWITCH

STANDARD CONTROLLER

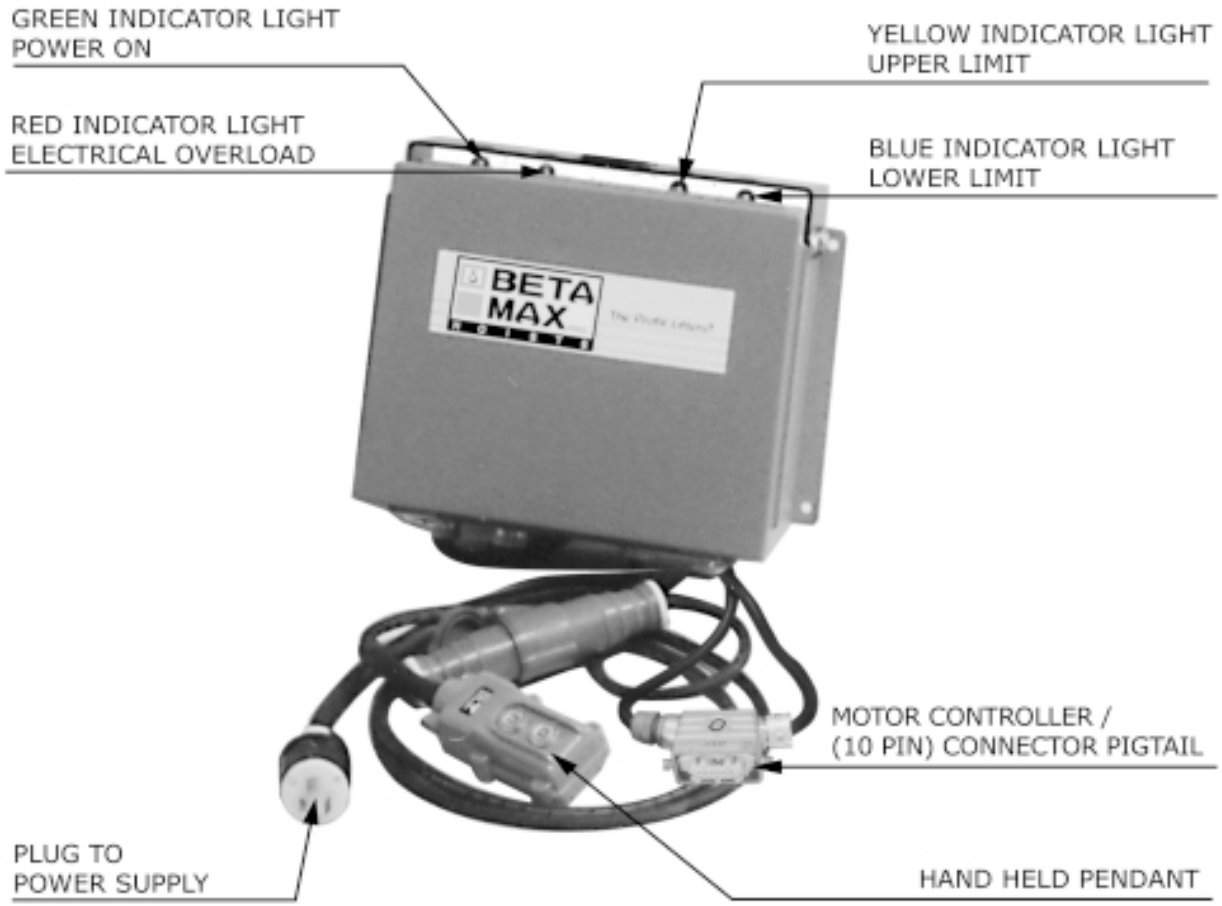
The hoist controller is built into a 12" x 6" UL approved enclosure with a hinged, top cover. The controller has a 20 AMP, 125 VAC twist lock AC connector, a blue connector for the up/down pendant and a 10 position connector going to the hoist motor.

STANDARD CONTROLLER OVERVIEW

It has 4 indicator lights, 1 fuse, a spare fuse holder and a voltage/current meter . (Some std. controllers are produced without indicator lights.)

- Green indicator light is for the power applied
- Red indicator light is for electrical overload
- Yellow indicator light is on for hoist upper limit
- Blue indicator light is on for hoist lower limit
- Spare fuse holder (inside cover)
- Voltage/current meter (inside cover)

MAXIAL STANDARD CONTROL BOX PART#80-10



UP-GRADED CONTROLLER

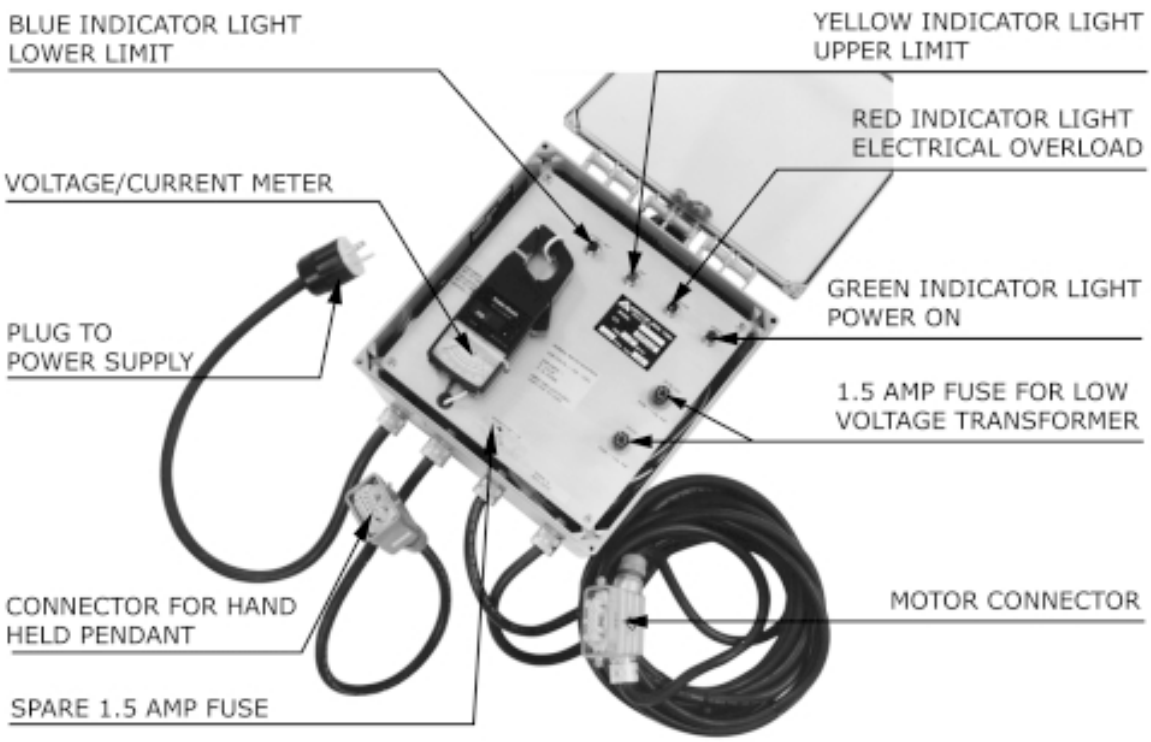
The up-graded hoist controller is built into a 12” x 12” x 6” UL approved enclosure with a clear see-through, hinged, top cover. The controller has a 20 AMP, 125 VAC twist lock AC connector, a 10 position connector for the up/down/emergency stop pendant and a 10 position connector going to the hoist motor.

CONTROLLER OVERVIEW

The front panel has a clear see-through cover. It has 4 indicator lights, 2 fuses, a spare fuse holder and a voltage/current meter.

- Green is for the power applied
- Red is for electrical overload
- Yellow is on for hoist upper limit
- Blue is on for hoist lower limit
- 1.5 AMP fuse for primary of 25 VAC control voltage transformer and 12 VAC contractor transformer
- 1.5 AMP fuse for primary of 24 AC emergency contractor transformer
- Spare fuse holder
- Voltage/current meter

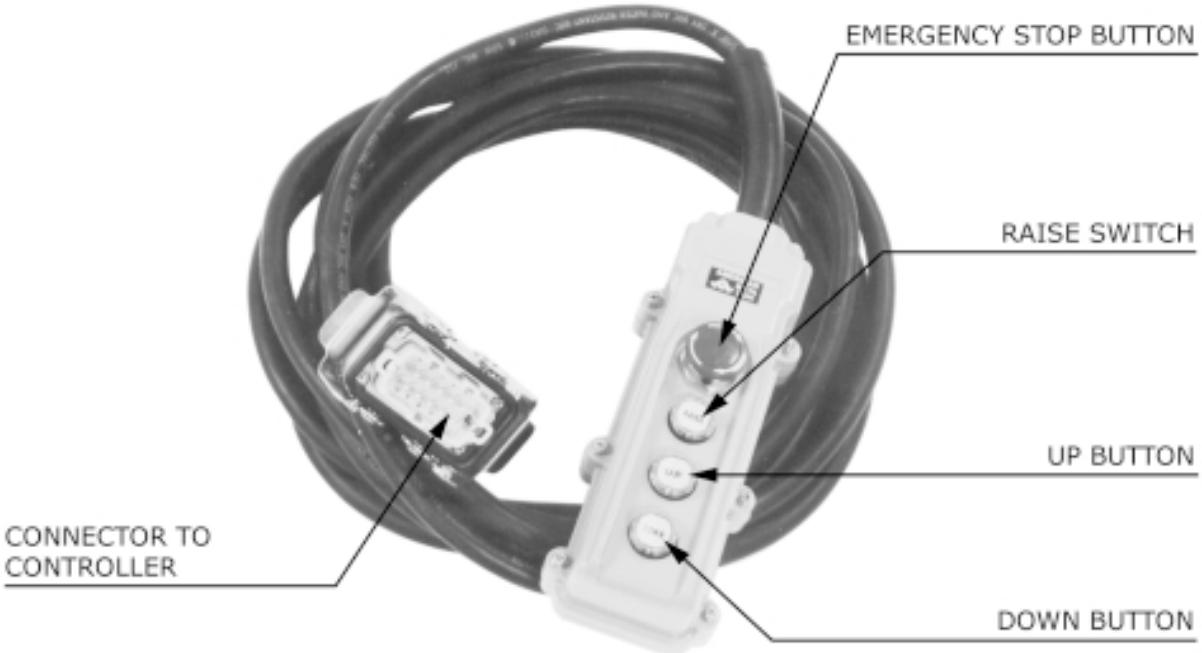
MAXIAL UP-GRADED CONTROL BOX PART #200-8



HAND HELD PENDANT (FOR USE WITH UP-GRADED CONTROL BOX)

The up/down control pendant is connected to the hoist box by a 10 position connector. The hand held pendant has four functions:

- EMERGENCY STOP
  The emergency stop switch is a spring loaded mushroom palm operated type. When depressed it disables all AC power to the controller. It is spring loaded to return out when turned in a clockwise direction.
- UP
  When the up button is depressed, the hoist will pull cable in, raising the load. An up limit condition or the depression of the raise button will interfere with proper operation of the up button.
- DOWN
  when the down button is depressed, the hoist will let cable out, lowering the load. A down limit or slack rope condition will interfere with proper operation of the down button.
- RAISE
  When the raise button is depressed, the hoist will not go in the up direction. It will only go in the down direction to raise the SLIDING HEAD SECTION (see section on raising the SLIDING HEAD pg. 14)

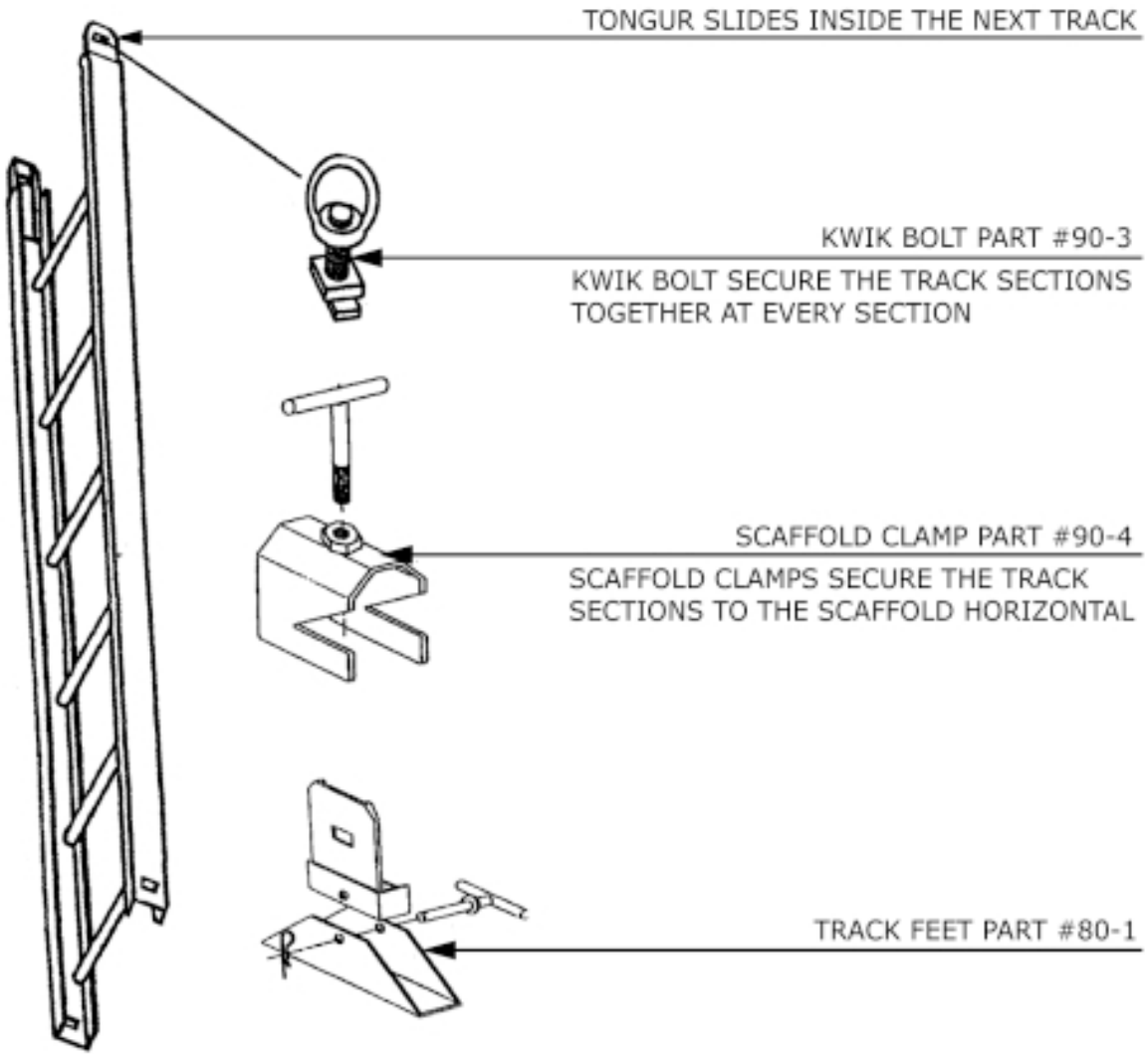


TRACK SECTIONS

The track sections are built of rugged aluminum so they are strong but lightweight, weighing only 3 lbs. per foot. the track sections come in three lengths, 9’ 9”, 6’ 6”, and 3’ 3”. Each track section is 24 inches wide and 4 inches deep. the rungs are not centered but are placed back on the section of the track so the front 1.5 inches of the 4 inch of depth can be used as a track for the UNIVERSAL CARRIAGE. The top of each track has a tongue that fits into the bottom channel of the next track section

TRACK SECTION SIZES

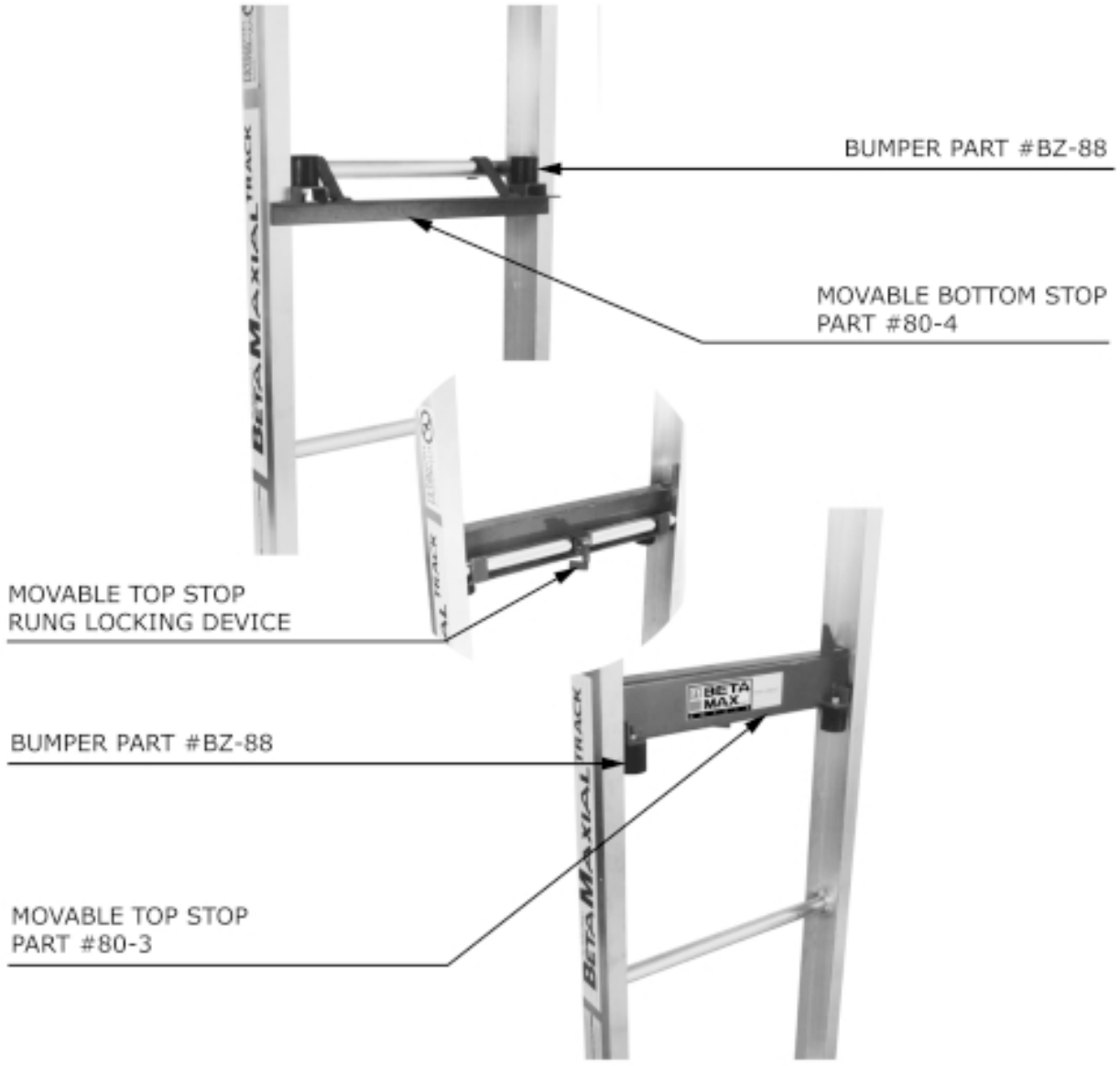
- 9’ 9” PART #90-2
- 6’ 6” PART #90-1
- 3’ 3” PART #90-5



MOVEABLE CARRIAGE STOPS

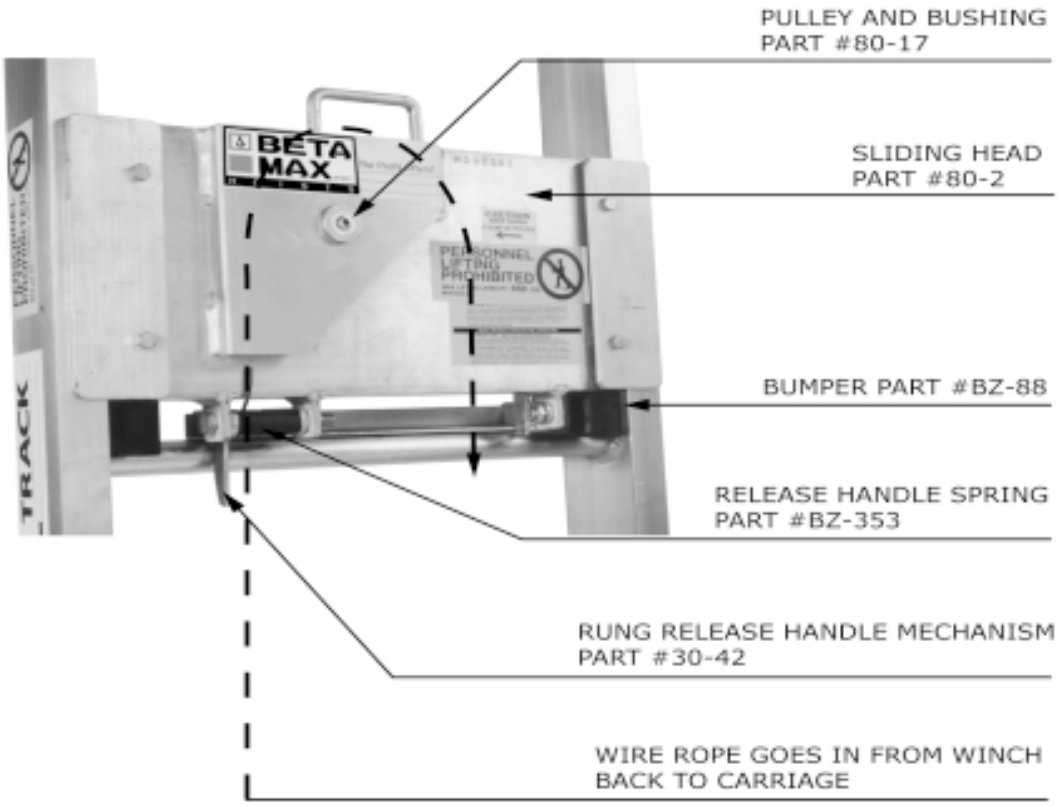
The MOVEABLE BOTTOM STOP rests on a rung below the Carriage to stop the Carriage at a predetermined location for loading and unloading a material basket. The MOVABLE BOTTOM STOP can be removed for flexibility of system use. It is used to stop the Carriage for lifting the Sliding Head and cable replacement if necessary.

The MOVABLE TOP STOP slides over a rung of the track and is held in place by a locking device. This stops the Carriage from traveling above that point. It is used to stop the Carriage at a predetermined location for loading of unloading of the material basket. The MOVABLE TOP STOP can be removed for flexibility of system use.



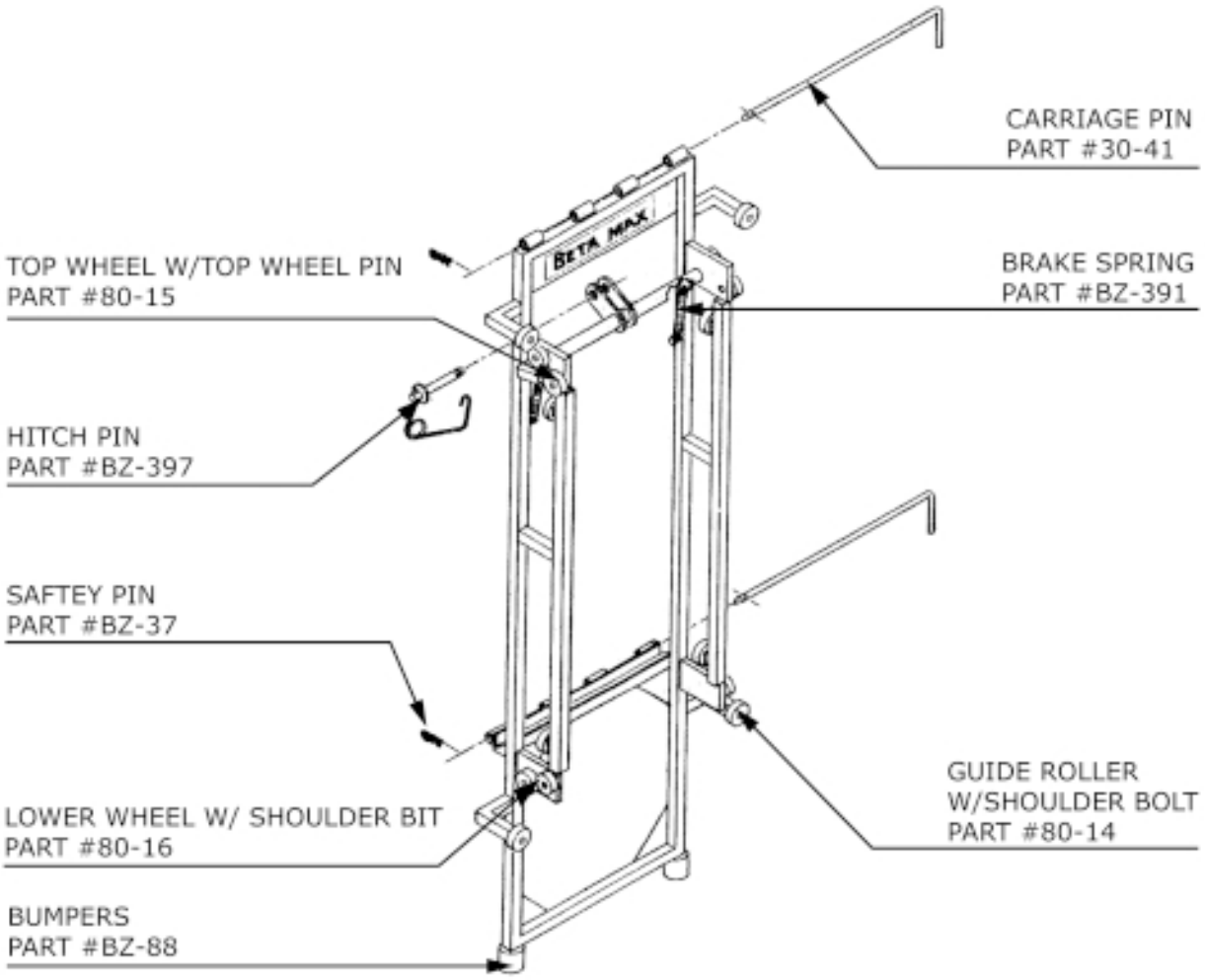
SLIDING HEAD

The SLIDING HEAD holds the pulley over which the wire rope travels and is designed to make it easier to add or remove track pieces to follow the work being done as it goes up and down. It incorporates a 5” pulley on which the wire rope coming from the winch goes up and over clockwise traveling from the front of the track and back down to the CARRIAGE. The HEAD slides on the track and a bottom arm that is spring-loaded pivots out to clear the horizontal rung members. The two rubber bumpers at the bottom of the head contact the CARRIAGE when it is at the top.

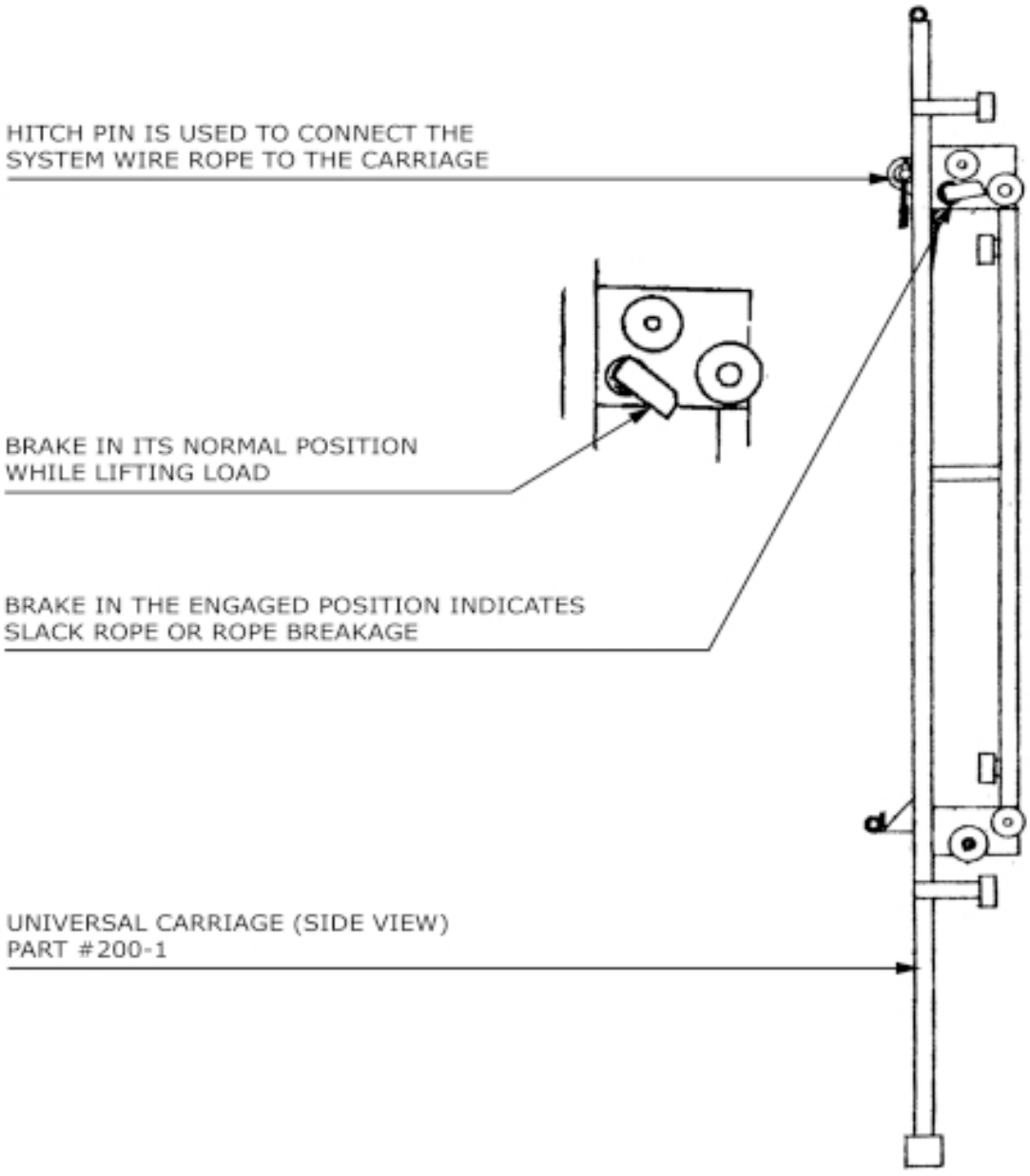


UNIVERSAL CARRIAGE

PART #200-1

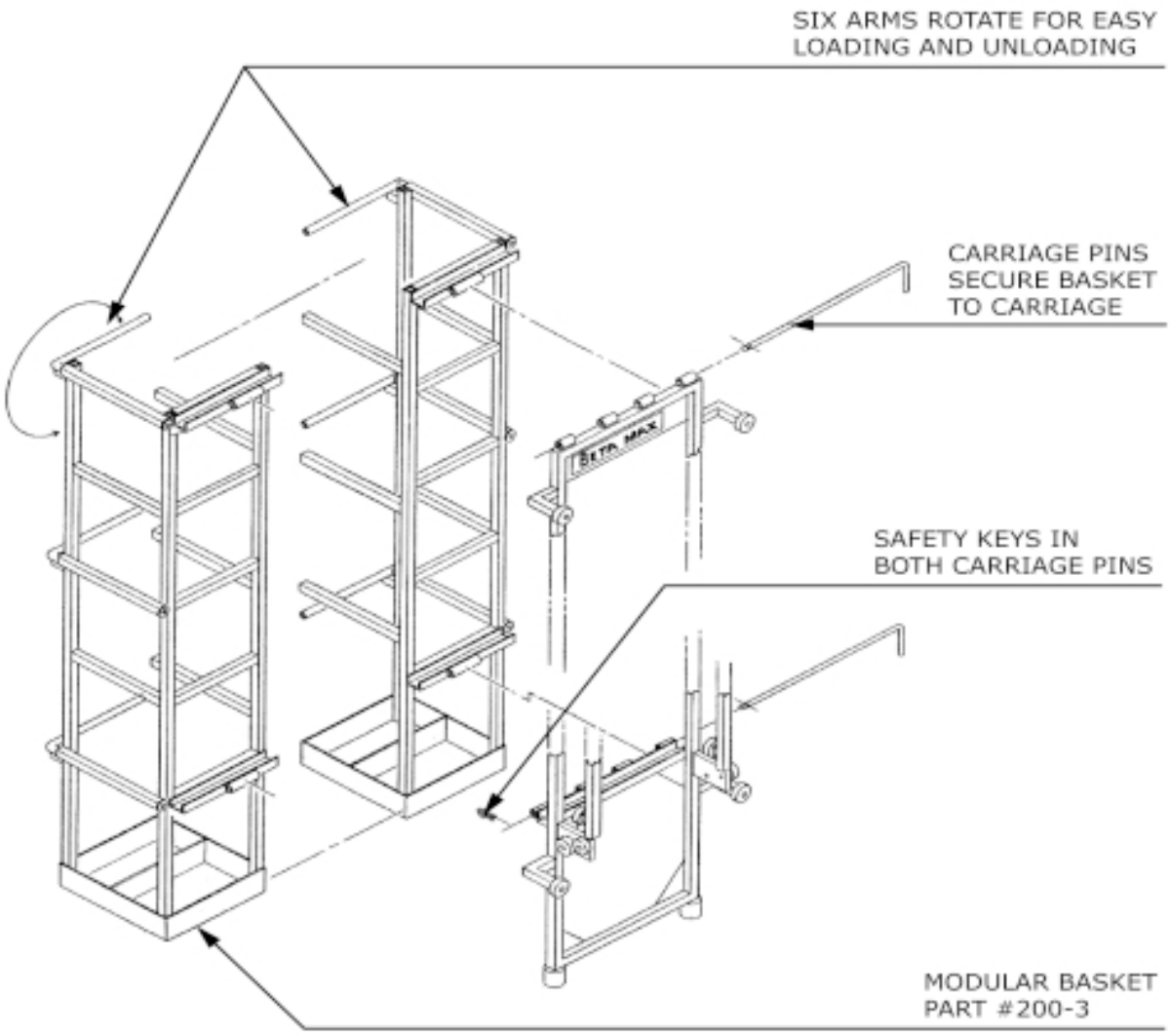


REPLACEMENT PARTS		
PART#	**DESCRIPTION**	**QTY. PER UNIT**
80-14	GUIDE W/SHOULDER BOLT	12
80-15	TOP WHEEL W/TOP WHEEL PIN	2
80-16	LOWER WHEEL W/SHOULDER BOLT	2
BZ-367	HITCH PIN	1
BZ-391	BRAKE SRING	2
BZ-37	SAFETY PINS	2
30-41	CARRIAGE PINS	2
BZ-88	BUMPERS	2


HITCH PIN IS USED TO CONNECT THE
SYSTEM WIRE ROPE TO THE CARRIAGE
BRAKE IN ITS NORMAL POSITION
WHILE LIFTING LOAD
BRAKE IN THE ENGAGED POSITION INDICATES
SLACK ROPE OR ROPE BREAKAGE
UNIVERSAL CARRIAGE (SIDE VIEW)
PART #200-1

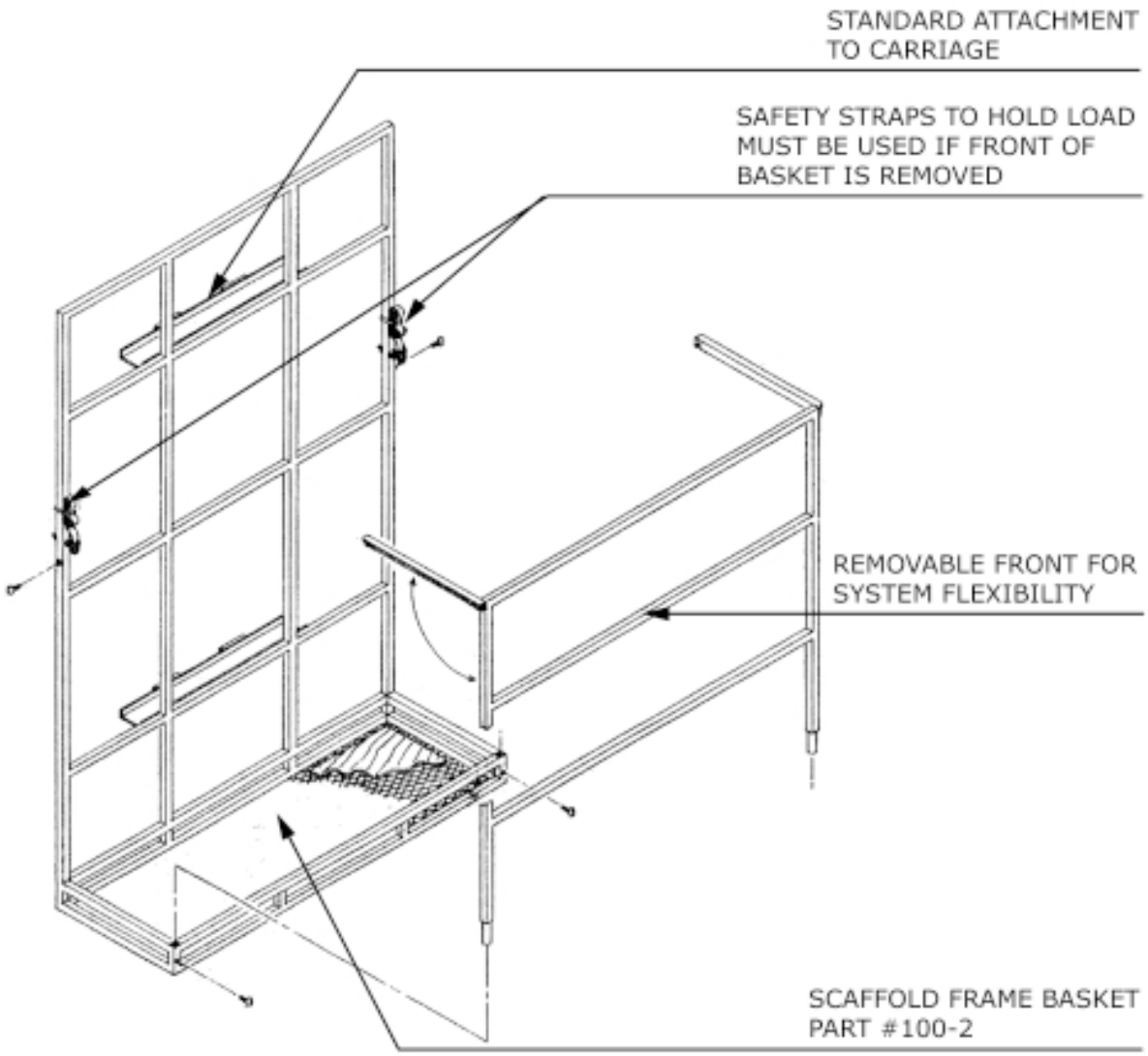
MODULAR (SYSTEMS) SCAFFOLD CARRIER

PART #200-3



FRAME SCAFFOLD CARRIER

PART #100-2



INITIAL SETUP

Once the ideal location for the Maxial System has been determined, the setup and operation are uncomplicated. There are no tools necessary for installing your Maxial Track Hoist System.

When deciding upon the most suitable position for the hoist, several items are to be considered, including whether the unit is to be attached to modular or frame scaffolding, whether the operating system is centrally located and whether the scaffold carrier clearances are satisfied.

1) Using a 9’9" section of track, lay the track flat on the ground. Notice that the rungs are not centered front to back on the track. Track should be positioned with rungs closer to ground than to installer.

2) Slide the Universal Carriage onto the base track section from the bottom checking to make sure that the top of the Universal Carriage is slid onto the track first. Slide the Universal Carriage all the way up the track until the bottom of the Carriage is above the bottom of the track.

3) Lift the track section into an exact vertical position against the scaffolding so that the Carriage is facing out. Once the track is in the correct position, attach it to the horizontal member of the scaffolding section using scaff-clamps. Twist the T-Bolt to pull the track tightly against the scaffolding. There should be 2 scaff-clamps positioned no further than 6.5 ft. apart all the way up the track.

4) Grasp the Sliding Head Section so that the “rung-lock” mechanism is positioned toward the bottom of the track and the pulley facing front. Slide the Sliding Head Section down from the top of the base system until it is secured onto the top rung of the track.

5) Take another piece of track with the tongue facing up and rungs at the back of the track and slide it down on the track that is secured to the scaffolding.

6) Align the holes that are in the tongue with the holes in the channel.

7) Take the flange bolt on the Kwik Bolt and insert through the holes and turn 90 degrees then tighten the handle. Repeat for both sides of each track section.

8) Secure the track to the horizontal scaffolding with two scaffold clamps on the sides of the track.

9) Grasp the Sliding Head Section by the handle pulling it up the track resting it on the third rung of the second piece of track just installed.

10) Slide the Universal Carriage up the track so that the bottom of the Carriage is higher than the fourth rung from the bottom section of the track. The Carriage will stay up by the mechanical brake.

11) Set the Hoist Motor in front of the base section with the wire rope on the drum facing out. Set the bottom of the hoist on the second rung from the ground. Slide the hoist in towards the back of the track twisting and locking the bottom and top rung latch.

12) Attach the control/electrical box to a horizontal member of the scaffolding so the box will be in view of the person operating the hoist.

13) Connect the 10-position connector (with two wire cables) from the control/electrical box to the connection on the back of the hoist, (see pg. 7 & 8)

14) Conect the 10-position connector with the one wire from the control/electrical box to the connector from the hand held pendant. (see pg. 9 & 10)

15) Connect the power plug from the control/electrical box to a 110V power source using no smaller than 10/3 power cord extensions. (see pg. 8 & 9)

16) Make sure the power light on the control/electrical box is lit. Check to see that the voltage reading on the meter does not exceed 130 volts or go below 105 volts. If power is not sufficient or too strong, find a different supply outlet. The preferred range is from 112 volts to 120 volts.

17) Depress the raise button. Both indicator lights should be on-up and down limit. The hoist will only go in the down direction.

18) Depress the down button on the hand held pendant with one hand and grasp the end of the cable with the other hand. PULLING FROM BEHIND THE SLACK ROPE BAR. PLEASE ALWAYS WEAR A GLOVE WHEN HANDLING THE CABLE. While depressing the down button on the pendant, walk backwards away from the hoist about 20 feet.

19) Keeping a tight pull on the wire rope from the drum, pass the end of the cable to a person at the Sliding Head Section.

20) Thread the cable from the hoist through the outer side of the pulley on the Sliding Head Assembly and back down through the center to attach to the Universal carriage. (see pg. 13)

21) Connect the end of the wire rope to the braking bar Hitch Pin on the Universal Carriage. (see pg. 14)

22) Secure the desired carrier onto the carriage. (see pg. 16 & 17)

23) Depress the down button and take the carriage up the track until it hits the Sliding Head Section. This should create an up limit condition and shut the hoist off. The up limit indicator light in the control/electrical box should be lit.

24) depress the down button. The Universal Carriage will come down the track until it hits the ground. This should create a down limit condition and shut the hoist off. The down limit indicator light in the control/electrical box should be lit.

25) You are now ready to use the Maxial Track Hoist.

RAISING SLIDING HEAD

This procedure takes two people, one at the motor and one above the sliding head.

1) Lower the Universal Carriage down to the rest on the ground or rest on the bottom stop. (The down limit light should be lit in the control/electrical box). (see pg. 8 & 9)

2) Press the raise button (available on up-graded controller only—skip to step 3 if using a std. controller) on the hand held pendant. (The down limit light should be lit along with the up limit light in the control/electrical box). (see pg. 8 & 9)

3) With a glove on, grasp the wire rope with one hand at least one foot above the motor. (Always keep a tight pull on the wire rope).

4) With the opposite hand, press the down button on the hand held pendant while keeping a tight pull on the wire rope with the other hand. Release approximately 20 feet of wire rope.

5) The person working above at the sliding head will pull up on the sliding head resting it on the rung of track at the desired level (never exceeding one rung above the last place the track is secured to the scaffolding).

6) If you need more wire rope to get to a higher rung, repeat steps 3 and 4.

7) If you have extra wire rope after the sliding head is resting on the rung at the desired height, press the raise button (available on up-graded controller only—skip to step 8 if using a std. controller) with the hand holding the pendant.

8) While keeping a tight pull on the wire rope with a gloved hand press the up button and reeve the excess wire onto the drum, never getting your hand closer than one foot to the motor.

9) Now you are ready to work at the desired height.

CHANGING WIRE ROPE ON MAXIAL TRACK HOIST

WIRE ROPE SPECIFICATIONS

MAXIMUM:

250 ft. of 1/4” galvinized 7 x 19 (min. breaking strength 7,000 lbs.)
350 ft. of 3/16” galvinized 7 x 19 (min. breaking strength of 4,200 lbs.)

INSTRUCTIONS:

1) Depress the down button to spool out the wire rope until you get close to the end where the wire rope is terminated to the drum.

2) Align the hole in the side of the drum (see pg. 22) with the two bolts that are wedging a plate to hold wire rope.

3) Disconnect power.

4) Loosen two bolts that hold wire rope guard. (see pg. 23)

5) Thread new wire rope into hole on the side of the drum and remove old wire rope. (see pg. 23)

6) Thread new wire rope into hole in the top of drum and wedge behind plate.

7) Tighten the two bolts within the hole on the side of drum to wedge wire rope between the plate and the drum.

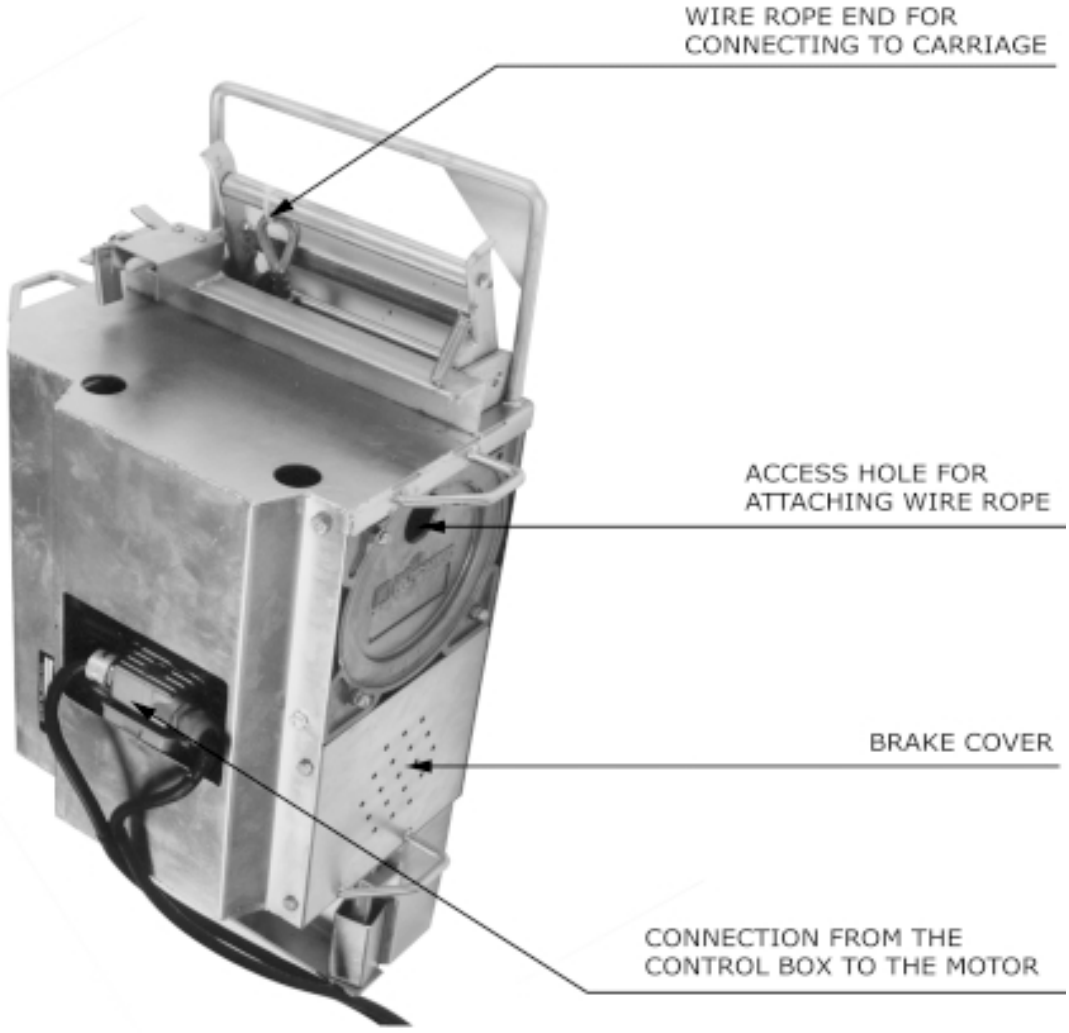
8) Put wire rope guard back on by tightening two bolts. (see pg. 23)

9) Reconnect power.

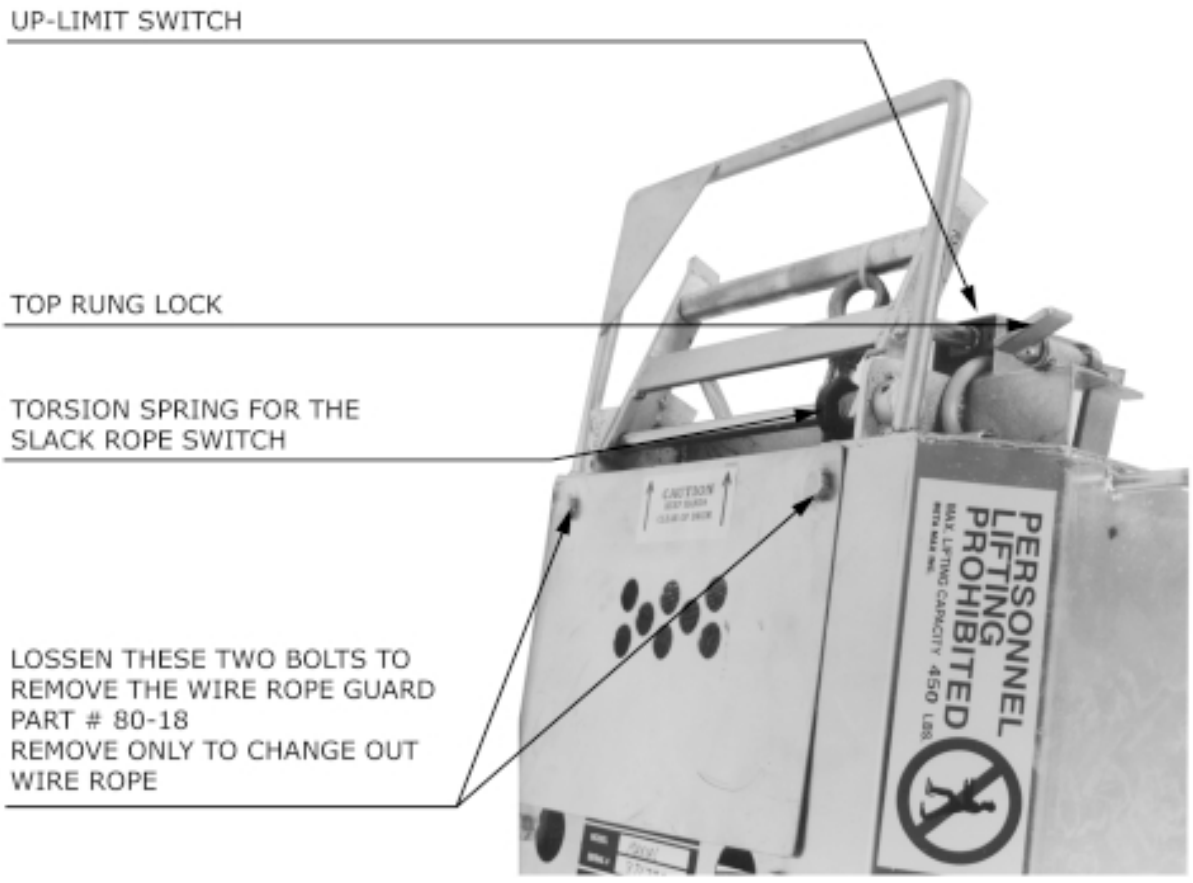
10) Keep one hand on the hand held pendant and one GLOVED HAND on the wire rope never getting the hands closer than 12” to the drum. Tighten grip on wire rope and depress the up button.

11) Always keeping a tight pull on the wire rope, spool the wire rope onto the drum keeping a nice tight spool.

12) For more inforamtion on the initial set-up or moving the Sliding Head Section refer to pages 18, 19, and 20.


WIRE ROPE END FOR
CONNECTING TO CARRIAGE
ACCESS HOLE FOR
ATTACHING WIRE ROPE
BRAKE COVER
CONNECTION FROM THE
CONTROL BOX TO THE MOTOR

WIRE ROPE GUARD



MAXIAL BRAKE OPERATION AND PROCEDURE

BRAKE OPERATION:

The motor shaft (6) extends through the rear box cover plate (25) and the grease seal (9) which prevents the gear box oil from getting on the brake disc (17) .

The brake disc drive coupling (16) is held to the shaft (6) by the key (7) and inner and outer snap rings (15).

The brake action and holding force is accomplished by two small springs (H) and five large springs (E) with plungers (F) pushing against plates (B) and (C) putting pressure on the brake disc (17) and cover plate (25).

An electromagnetic field is established by applying 100 voltage DC to magnet (D) which pulls plates (B) and (C) against (D) releasing pressure on either side of the brake disc (17) allowing the motor to turn.

The course adjustment of the braking force is supplied by springs (E) and (H). Turning the pressure ring lesser for more or less pressure controls the finer adjustment. The five plungers (F) fir into depressions in the back side of ring (G) preventing the ring from randomly turning .

BRAKE CLEANING

Loosen and remove the three hex head screws (19), making sure that the brake gap adjustment bolts (A) do not turn in the magnet (D) .

Remove the complete brake assembly from the cover plate (25). Item (6), (7), (9), (15), (16) and (17) should stay with the cover plate (25) .

You may want to remove the outer snap ring (15), then the brake disc drive coupling (16), and then the liner snap ring (15) so you can inspect the grease seal (9) to make sure there are not any oil leaks.

After cleaning, reinstall brake assembly and tighten three screws (19) being careful not to move the brake gap adjustment bolts (A). After brake is in place, check air gap to be sure it is correct (.0 12" +/- .002"). (Refer to Brake Adjustment Procedure).

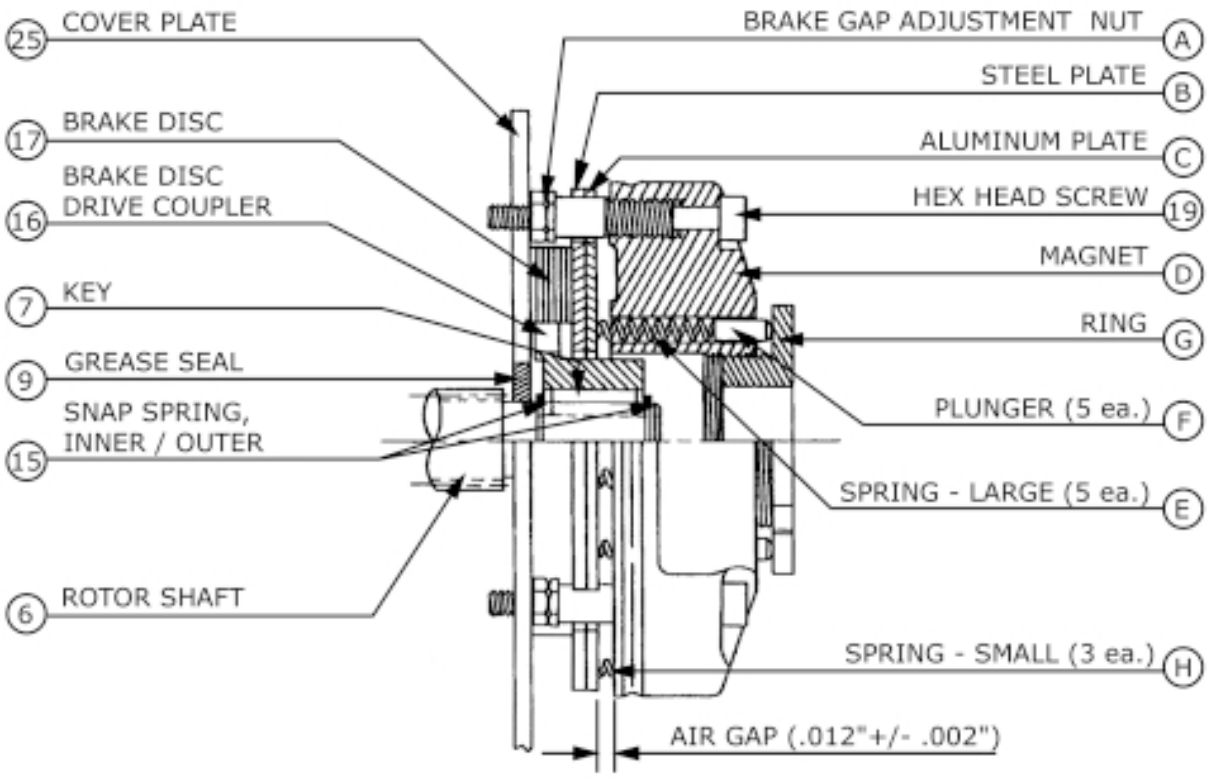
The electrical panel is designed with connectors so you can disconnect the motor and still operate the brake by itself.

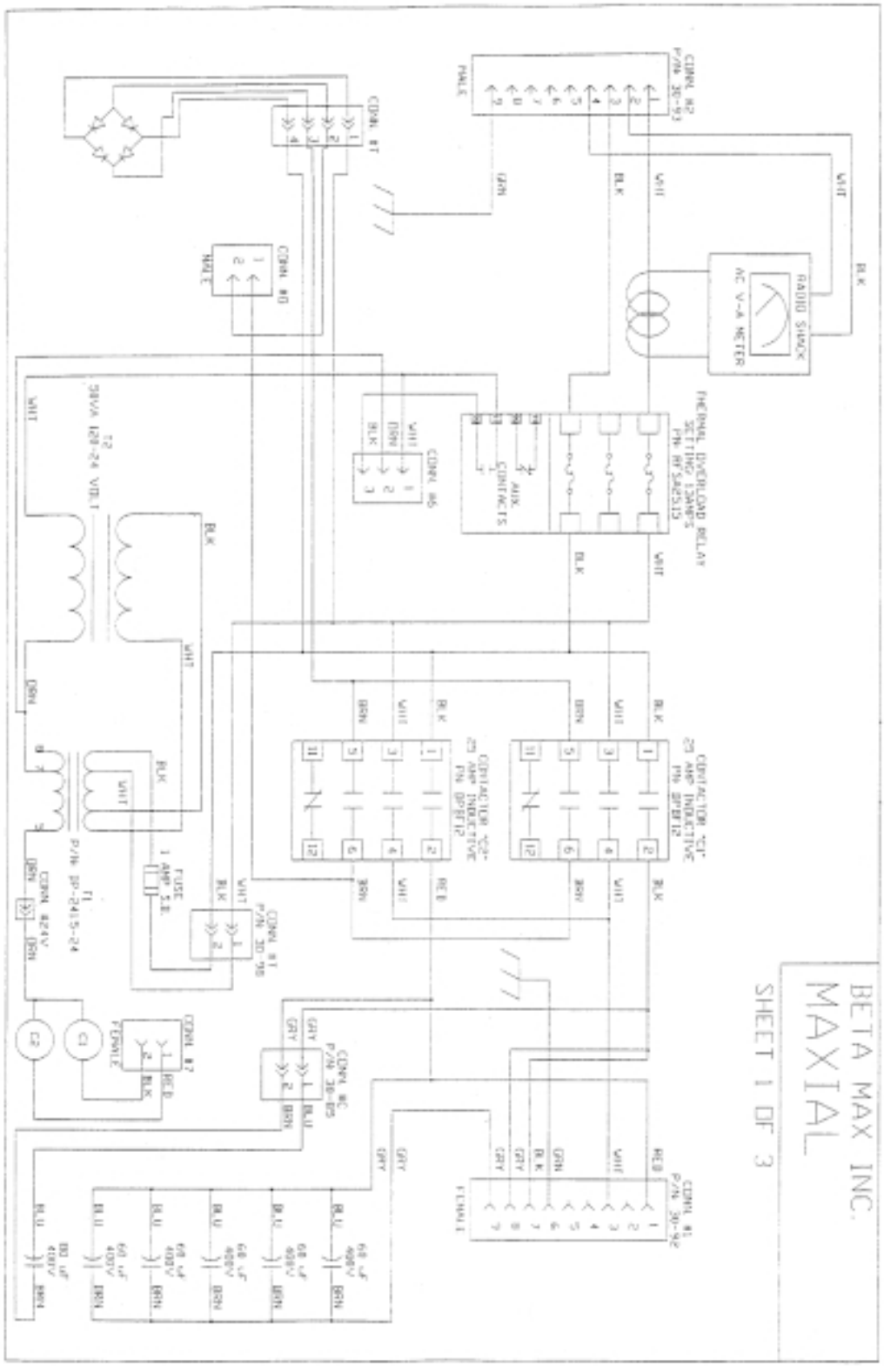
BRAKE ADJUSTMENT:

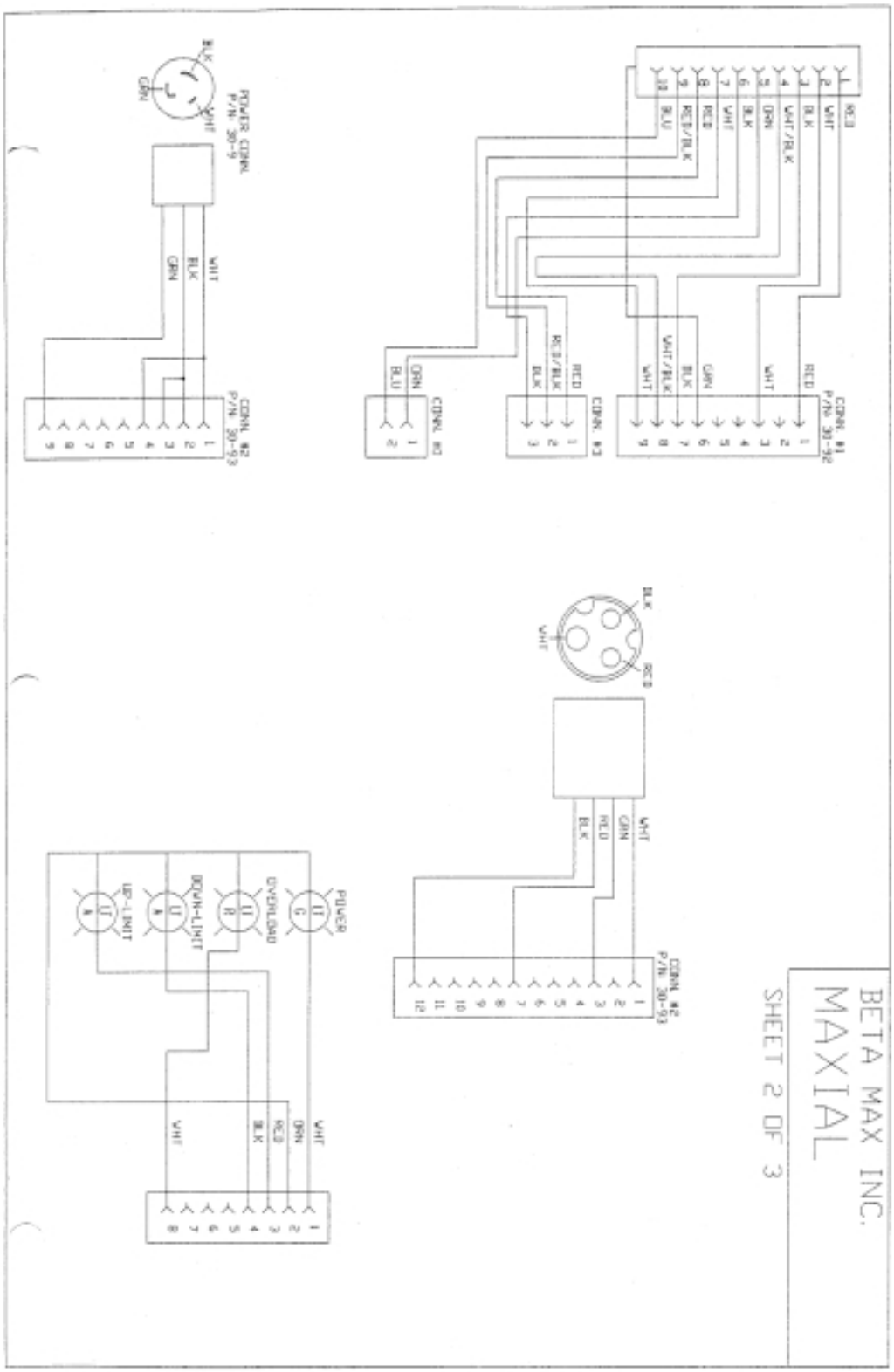
The three brake gap adjustment bolts (A) that determine the air gap distance are threaded into magnet (D).

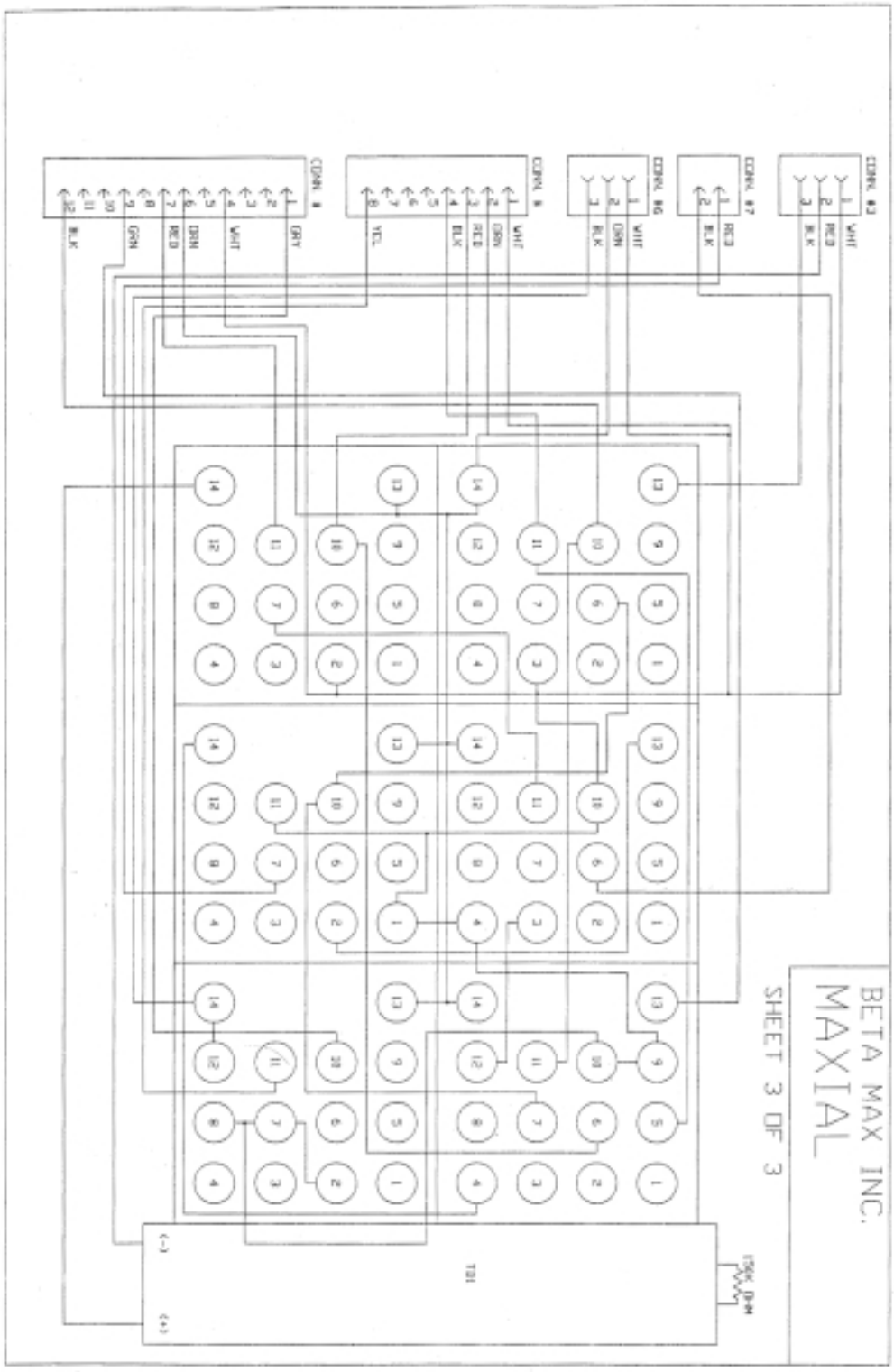
As a starting point, turn all three adjustment bolts (A) counterclockwise, (when viewed from the top), just far enough so that when screws (19) just lightly tightened. Next, loosen screw (19) just a little and turn bolt (A) counterclockwise while retightening screw (19) down snugly. Check air gap, making sure it is equal at each adjustment bolt (.012" +/- .002").

MAXIAL BRAKE DETAIL




BETA MAX INC.
MAXIAL
SHEET 1 OF 3


BETA MAX INC.
MAXIAL
SHEET 2 OF 3


BETA MAX INC.
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SHEET 3 OF 3

RECOMMENDED SPARE PARTS

12	Kwik Bolts	90-3
12	Scaffold Clamps	90-4
12	Guide Roller w/ Shoulder Bolt	80-14
12	Top Wheel w/ Top Wheel Pin	80-15
12	Lower Wheel w/ Shoulder Bolt	80-16
1	Sliding Head Section	80-2
1	Moveable Bottom Stop	80-4
2	Pins for attaching Carrier to Universal Carriage	30-41
1	Clevis Pin for attaching Wire Rope to Carriage	BZ-367
1	Spring for Slack Rope Bar	BZ- 353
2	Springs for Emergency Brake on Carriage	BZ-391

DAILY MAINTENANCE

1) Make sure that wire rope is reeved onto Maxial drum evenly.

2) Check up limit switch with up limit indicator light in the control box.

3) Check down limit switch with down limit indicator light in the control box.

4) Check emergency shut off button. (on up-graded controller)

5) Check spring for emergency brake on Carriage.

6) Check wheels on Carriage-looking for worn spots.

ASSEMBLY VIEW