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TYPE: NON-KIDDIE

HI-ROLLER
OPERATIONS
MANUAL
SERIES III

CARINYTOWN.COM

Manufacturers of
The Hi-Roller • Super Loops • Whirlwind • Paratower

THE HI-ROLLER CO.

(806) 293-5214
FAX (806) 293-5215

P.O. Box 1968
Plainview, TX 79073-1968

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INTRODUCTION

This Operation Manual has been prepared for the ride owner and operator of the Hi-Roller Amusement ride. This ride has been designed and manufactured with SAFETY as a major goal, however, accidents cannot be prevented unless the operator understands and practices all safety precautions. The Hi-Roller Company advises all operators to read this book and make special note of the many cautions listed in this manual.

Procedures for erection, dismantling, transport and operation are given, and information for inspection and maintenance are included.

The maintenance portion of this manual is provided for guidance of those who wish to install, repair, maintain, or adjust the Hi-Roller equipment covered herein. This information has been prepared with the basic viewpoint to give accurate and concise data needed to perform minor adjustments as well as major overhauls.

This information is not elementary, as it is intended for operators and servicemen who are familiar with rotating machinery in general. It is not intended, nor would it be possible in such limited space, to cover every possible condition which may be encountered. Always use good, sound mechanical practices and SAFETY PRECAUTIONS.

All specifications are in accordance with Engineering designs and should be adhered to in all repairs. Operation and maintenance information on equipment other than that of the Hi-Roller Company is taken in part from the various manufacturers' manuals. If the equipment manufacturers issue later instructions, or in the event of conflict, the manufacturer's information will take precedence over that shown in this manual, unless specifically stated otherwise.

Specifications and components covered in the manual are for standard equipment current at the time this manual was approved for printing.

The Hi-Roller Company reserves the right to discontinue models at any time, or change specifications or designs of any model without notice and without incurring any obligation.

HI-ROLLER

THIS IS TO CERTIFY

Hi-Roller Serial No.: 93PAHR014

Sold To: REITHOFFER EQUIPMENT CO., INC.

Date: JULY 26, 1993

WHEREAS the amusement ride commonly known as Hi-Roller, manufactured by The Hi-Roller Company of Plainview, Texas, has been manufactured in accordance with known standards as recommended by ASTM, ASM, ASME, AWS, ANSI, ISO, NFPA, NEC, and other national and state standards in effect at time of manufacture.

Testing after manufacture includes non-destructive magnetic particle and ultrasonic tests conducted by an independent inspection company, where upon final approval, a certificate of conformance is issued for each serial number.

Load testing conforms to the sand bag, 170 pounds per passenger seat, during prolonged operating cycles.

Field modification or lack of maintenance may alter the above conditions.

The Hi-Roller Company

LIMITED WARRANTY

The Hi-Roller Company warrants to owners of new products manufactured by The Hi-Roller company that The Hi-Roller Company will make any repairs on any part of the equipment, except trailer wheels and tires, made necessary because of defects in material or workmanship for a period of 120 days from the first day the new product is in service for pay. Warranty repairs will be performed without charge to the owner by The Hi-Roller Company at The Hi-Roller Company factory at Plainview, Texas, within a reasonable time after delivery of the new product to The Hi-Roller Company factory.

All parts to be considered for warranty must be returned to the factory at Plainview, Texas, freight prepaid. The warranty department of The Hi-Roller Company will inspect and evaluate said parts, and it shall be at the option of The Hi-Roller Company to repair, replace or credit owner's account should the matter not be covered by the warranty.

NOT COVERED BY THIS WARRANTY are repairs or replacement of parts required because of misuse, negligence, alteration, accident or a lack of normal maintenance. ALSO NOT COVERED BY THIS WARRANTY are the repair or replacement of items such as filter, brake lining pads, wheels, tires or other similar items required in normal maintenance.

NOT COVERED BY THIS WARRANTY are the loss of time, inconvenience, loss of the use of the product or other matters not specifically included herein.

The Hi-Roller Company does not authorize any person to create for it any other obligation or liability in connection with this product.

THIS WARRANTY IS GIVEN EXPRESSLY AND IN PLACE OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE AND THIS WARRANTY IS THE ONLY WARRANTY OF ANY KIND MADE BY THE HI-ROLLER COMPANY. THE HI-ROLLER COMPANY SHALL NOT BE LIABLE FOR CONSEQUENTIAL COMMERCIAL DAMAGES RESULTING FROM BREACH OR WARRANTY.

WARRANTY OF ALL PARTS OR THE PRODUCT NOT MANUFACTURED BY THE HI-ROLLER COMPANY SHALL BE COVERED ONLY BY THE WARRANTY, WHETHER EXPRESS OR IMPLIED, OF THE MANUFACTURER OF SAID PARTS AND ARE NOT COVERED BY THIS HI-ROLLER COMPANY WARRANTY.

ALL SALES OF PRODUCTS BY THE HI-ROLLER COMPANY ARE MADE AT THE FACTORY IN PLAINVIEW, TEXAS, AND ALL CONTRACTS RELATING THERETO, AND THIS WARRANTY, SHALL BE DETERMINED AND CONSTRUED UNDER THE LAWS OF THE STATE OF TEXAS.

MPX TESTING LABS, INC.
P.O. Box 1629
Hurst, Texas 76053
817-534-1888
817-534-1890 FAX

Control No.

CERTIFICATE OF CONFORMANCE

Customer: Hi-Roller Company
Hwgy. 194 West
Plainview, Texas 79072

Date of Issue:

Nomenclature:

Quantity: One assembly--in finished condition--new manufacture

Serial Number:

Date of Manufacture:

Nondestructive Evaluation Processes Used In Certification Procedure

Visual: 100% visual inspect all items assembled at Plainview, Tx facility. Electrical & hydraulic systems exempt

Magnetic Particle: Dry method utilizing 120 VAC yoke with # 1 gray powder. Evaluation performed on all filet welds deemed critical to ride operation.

Ultrasound: 20% random ultrasonic inspection of consumable spot welds.

THIS CERTIFICATION IS HEREBY ISSUED IN ACCORDANCE WITH THE BELOW LISTED STANDARDS:

Hi-Roller Company Standards

MPX Testing Labs Representative: L. Carl Hall

Manufacturer Representative: Louis L. Wallace

PRE-OPENING INSPECTION PROCEDURES

The following items are recommended to be inspected prior to approving the Hi-Roller ride for operation:

1. All outriggers and braces should be in position and properly secured. Refer to the diagram in the operation manual.
2. Footings. Determine that all load points are acceptable as shown in the load diagram in the operation manual.
3. Check to see that all hinge bolts are properly tightened, and all erection braces are stored out of the way of operation.
4. Ride should be level and plumb. It should be as near to plumb as can be determined by visual inspection.
5. All pins shall have safety devices such as snap pins or hair pins.
6. Check condition of all bolts and nuts at the track bearings.

General Machine Structure

1. Inspect the area of the track hinge for visible cracks.
2. Inspect the area where the pedestals are welded to the trailer deck.

Train Inspection

1. Check for worn wheels. Replace if diameter is less than 4 1/2 inches.
2. Check for worn pins or bushings in the train couplings. Replace if total movement in the coupling is more than 1/16 inch.
3. Check safety bolts in the coupling area.
4. Check safety cables and clamps. Frayed cables or broken clamps must be replaced.
5. Check wheel truck mounting bolts, nuts and cotter pins. Repair as required.
6. Inspect connecting lugs at point welded to 2" tube on each end of car.

HI-ROLLER

7. Check upper and lower wheel axle nuts and cotter pins. Check guide wheel axle bolt and setscrew. Adjust/repair as required.
8. Lubricate all connection joints, wheel truck pivot pins on train cars and power units each week.

Passenger Compartments

1. The seats should be firmly bolted in place.
2. The head rest and side pads should be secure and have adequate cushion to prevent injury.
3. The bolster pads should have adequate foam rubber to hold the passenger firmly in their seats.
4. Minor damage to bolster covers is permissible if the foam rubber is still in place.
5. Each door has two latch bars that must engage with latch hooks. Handle/lever must straddle guide pin and safety clip must be in place. Inspect linkage for excessive wear and replace as required.
6. Gas filled cylinders hold doors open and must be replaced if they become defective.

Safety Devices

1. Check proper function of following safety switches: Operator Seat and Safety Gate
2. Check proper function of platform photoelectric sensor beams and siren warning.

If you, as an inspector, have any questions concerning the ride, operation, or possible problem areas, such as weld cracks, please call us at the factory.

The Hi-Roller Company
P. O. Box 1968
Plainview, TX 79072
Phone 806-293-5214

ERECTION PROCEDURES

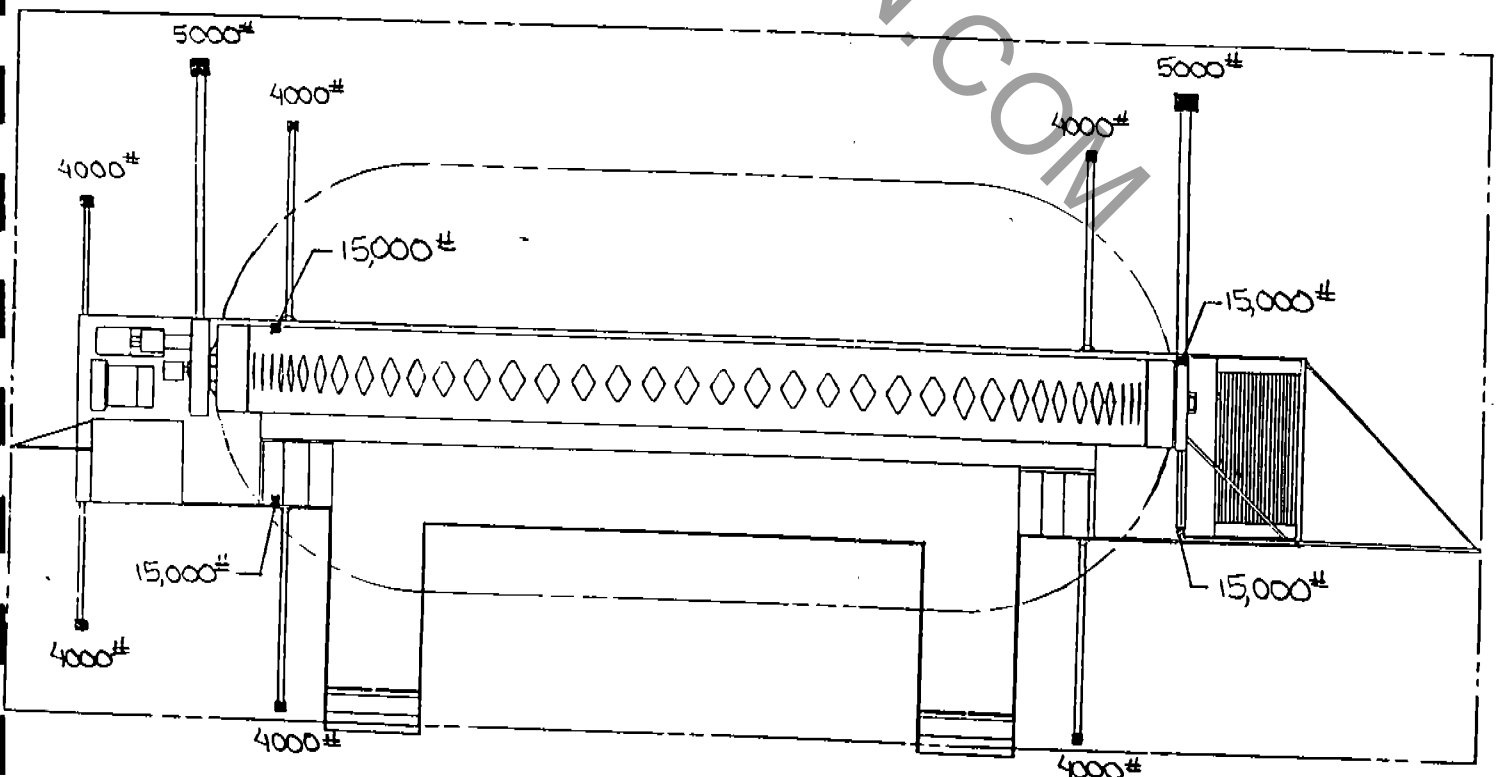
1. Locate the trailer on a firm level site.

CAUTION: Footings must be suitable for about 5000 lbs. per square foot at all landing gears and outrigger pads.

2. Place matting boards under the landing gear and lower landing gear.
3. Remove the tractor and visually level the ride using the landing gear.
4. Extend the outriggers. Place matting boards under the shoes and lower the outrigger shoes until the outriggers have a firm footing.

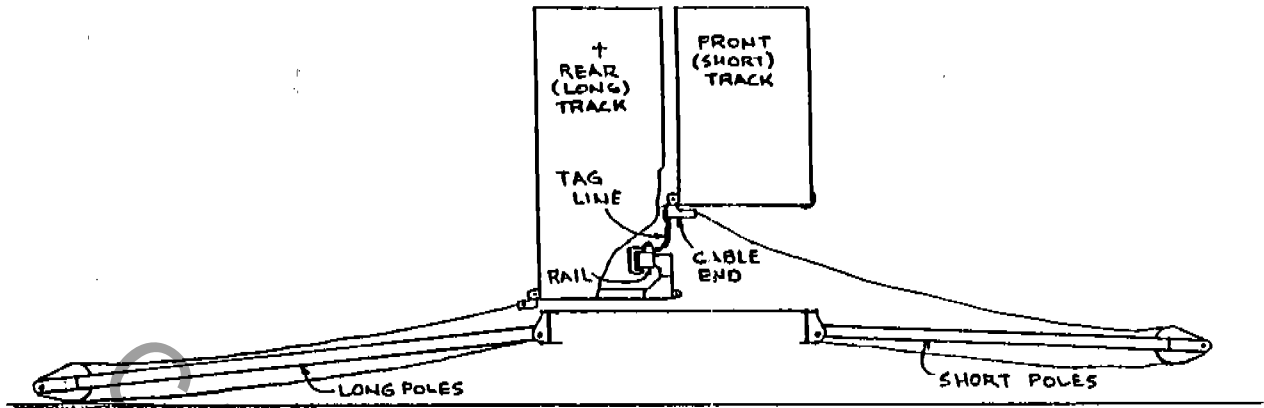
CAUTION: DO NOT TRY TO LIFT THE RIDE WITH THE OUTRIGGERS.

5. Remove all the fencing, loading ramp and stairs, the bally cloth, and the erection poles and sheaves. Lower the loading steps.
6. Raise the sign frame. Lock in place using the turnbuckle and pin on each end of the ride. As the sign frame is being raised, be sure the sign wiring and hydraulic hoses are free to move up with the sign.
7. Raise the sign face so fan of cards will not interfere with the track erection.



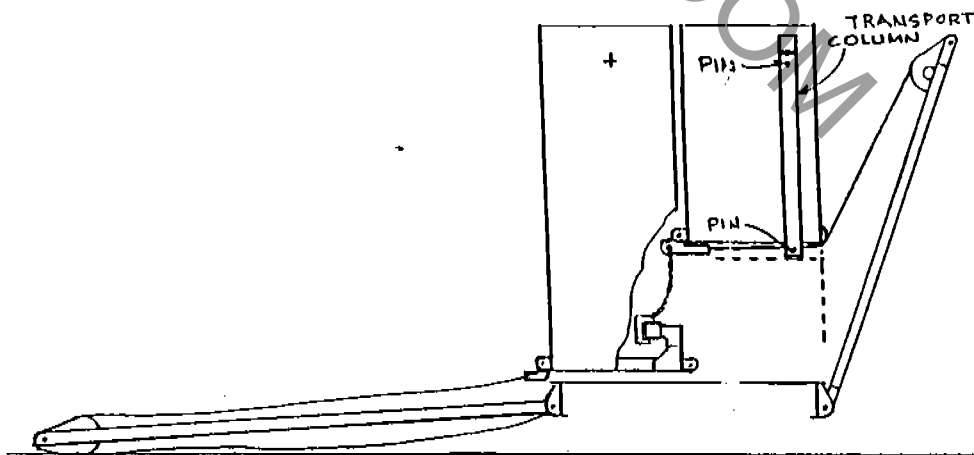
TRACK ERECTION PROCEDURES

The following procedures are to be accomplished by operating the hydraulic control valves. These control valves are located on right side of trailer, next to front pedestal. See Page 86 in Operations Manual.



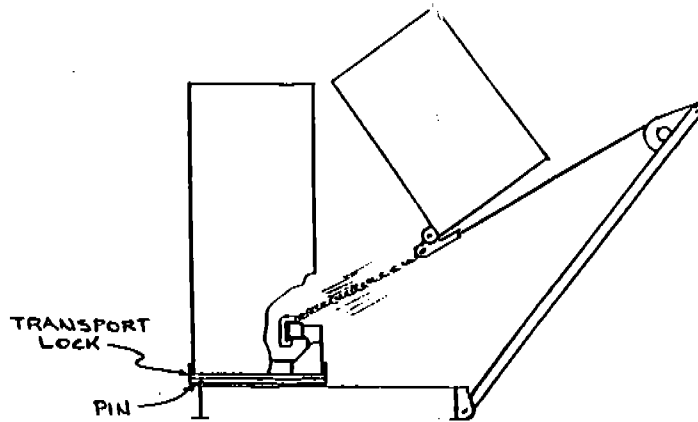
Assembly To Begin Erection

1. Assemble the track erection A-frame poles.
NOTE: The short poles are used on the front (entry) side of the ride (note color coding).
2. Extend the cables to their full length and pin the cable ends to the lugs provided on the track.
NOTE: It may be necessary to raise the end of the short A-frame poles to attach the cable to the track.
3. Attach tag line from the cable end to the front (short) track cable assembly to the rail on the rear (long) track.



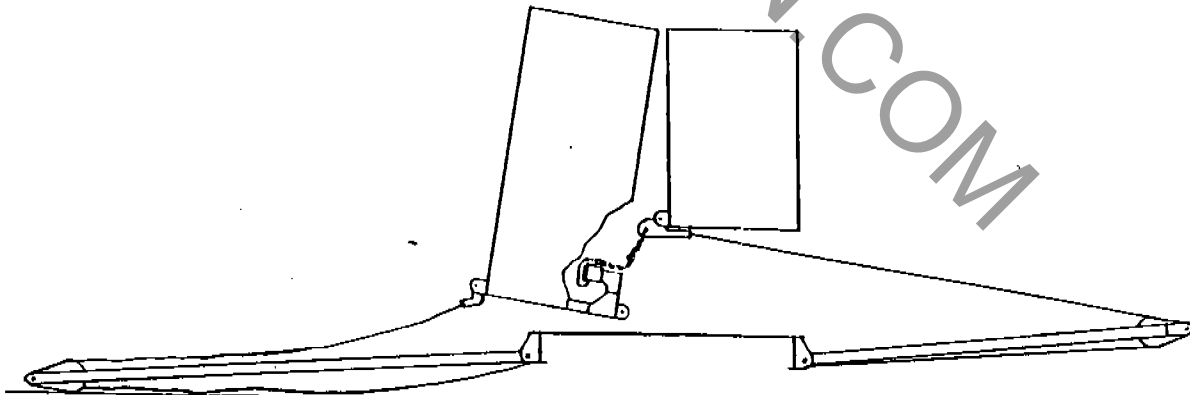
Remove Transport Columns

1. Take up the slack on the front (short) track erection line.
2. Pull the pins and remove the transport columns located at each end on the front (short) track section.



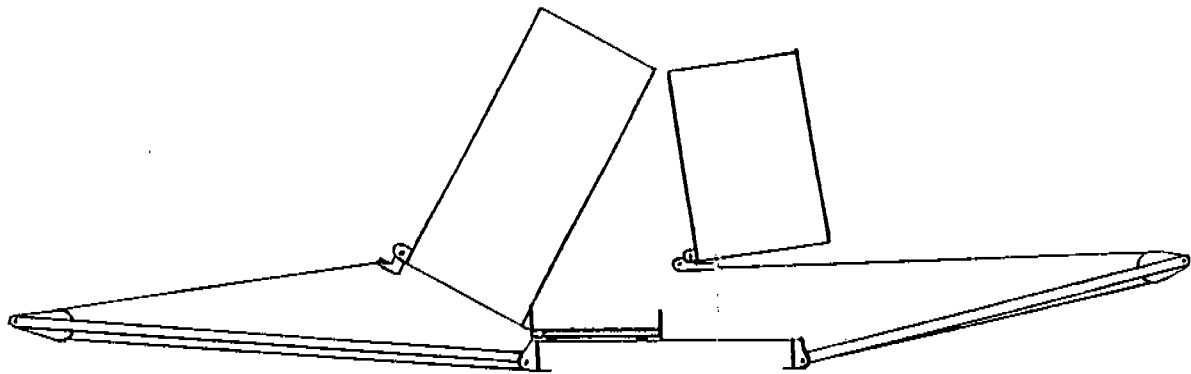
Unfasten Transport Locks

1. Raise the front track section until the tag line to the rear section becomes taut.
2. Pull pin on each transport lock located at each end of the rear (long) track section and rotate lock to lay on trailer deck.



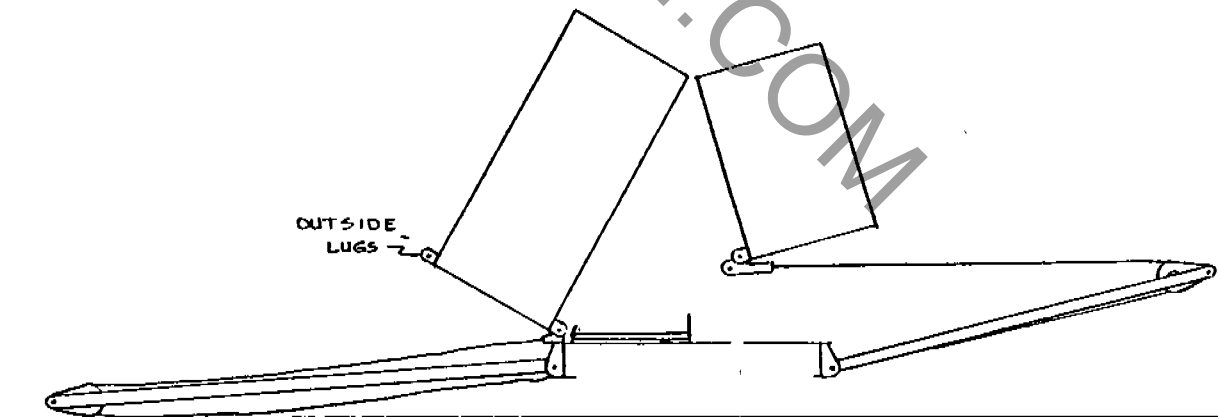
Remove Tag Line

1. Lower the short section until tag line becomes loose.
2. Remove the tag line.



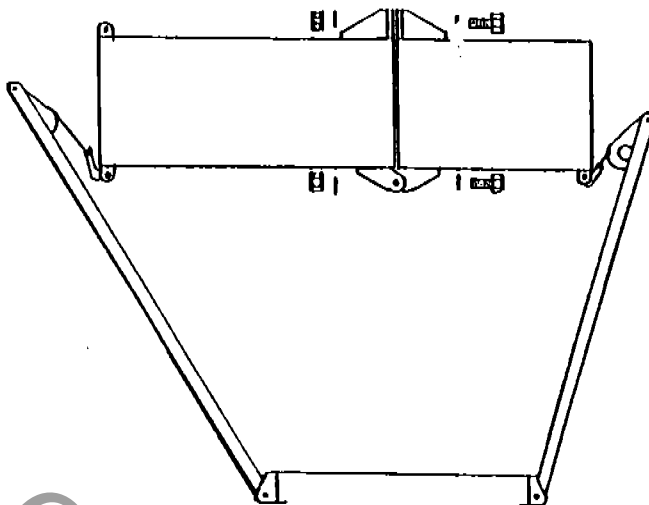
Position Rear Track To Reattach Cable

1. Raise the rear track section to clear side of trailer.
2. Rotate the front transport lock to the transport position (vertical) and pin.
3. Slowly lower the rear track section until it comes to rest against the transport lock.



Reattach Cable

1. Remove cable from outside cable lugs.
2. Pin cable to erection lugs located on the opposite side (inside) of track.



Connected Track Sections

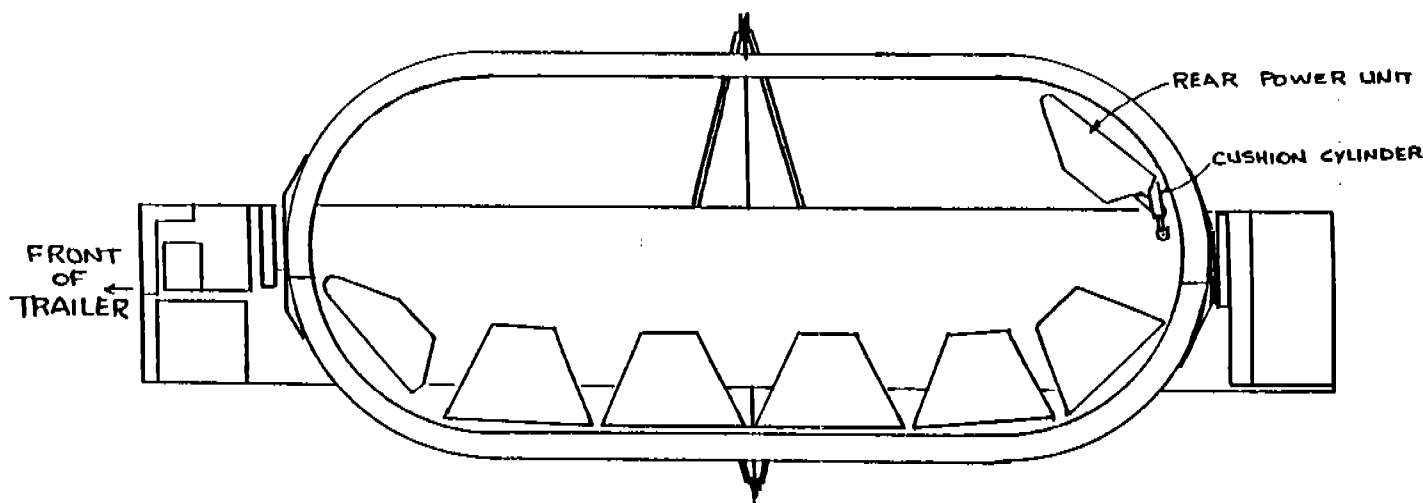
1. Raise the front track section until the track is almost horizontal, then raise the rear track section.

CAUTION: Do not try to raise the rear (long) section first as the short section will be lowered onto the trailer, possibly damaging the track section or main bearings at each end of track.

CAUTION: Do not allow personnel between track sections until track mating flange bolts have been installed.

2. Check alignment of track dowels at each end as rear (long) track section is being raise. Dowels should help align the two track sections. (NOTE: Periodically wipe grease on dowels).
3. Continue raising the long section until the rails and flanges have met.
4. Install the track bolts and tighten the nuts (torque 350-400 ft. lbs.) and insert cotter pins. (5 bolts, washers, nuts and cotter pins - each end).

CAUTION: Operator must stand on end platforms and reach over top side of track mating flanges to install top 3 bolts, washers and nuts. After top bolts have been installed operator may install lower bolts. To dismantle, reverse operation.



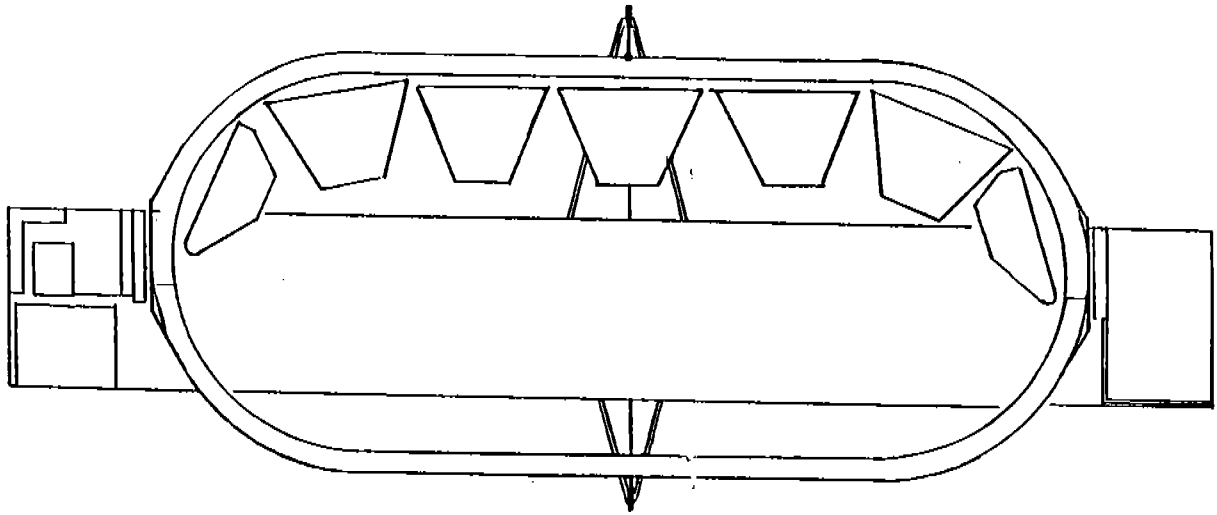
Connect Rear Power Unit To Train

NOTE: The rear power unit must be connected to the train while track sections are in the horizontal position and A-frame cables are tight.

1. Remove the train locks on the rear power unit.
2. Tie cushion cylinder in such a position that the yoke will not lock up in the track rail spacers.
3. Manually move the rear power unit into the position to allow the cushion cylinder to be connected to the ball joint lug on car.

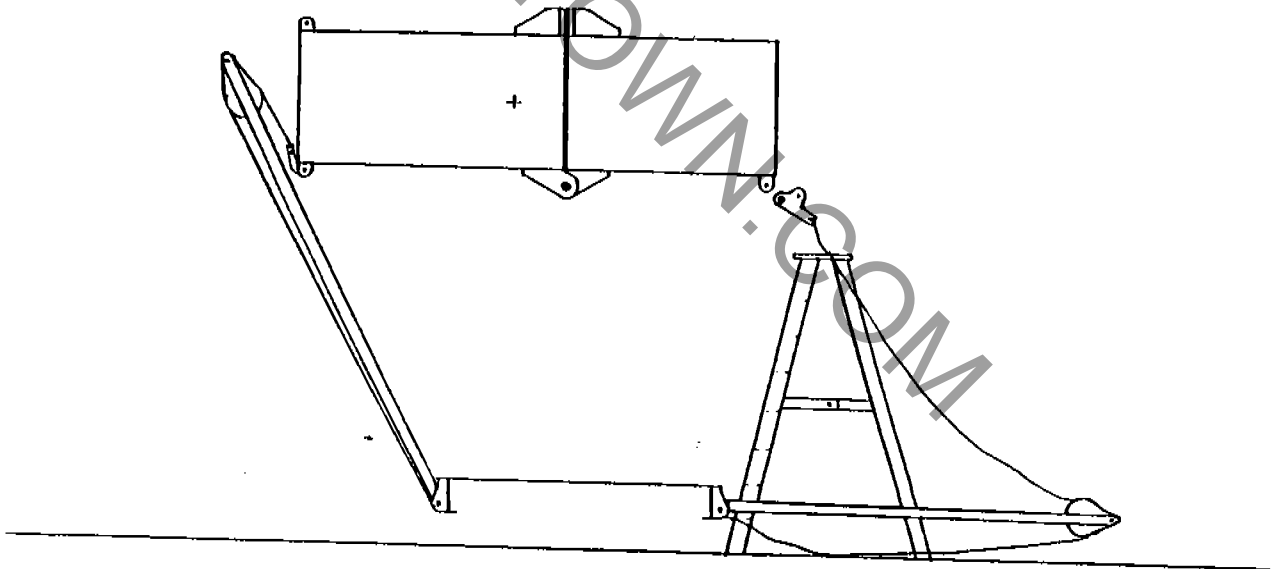
**CAUTION: DO NOT USE ELECTRICAL POWER TO MOVE
POWER UNIT WHILE CONNECTING TO TRAIN.**

4. Assembly cushion cylinder yoke and ball joint with pin, bushing, slotted nut, cotter pin and four (4) 1/2" capscrews with lockwasher.
5. Install safety cable and secure with cable clamps.
6. Remove all the remaining train locks.



Position Train In Rear (Long) Track

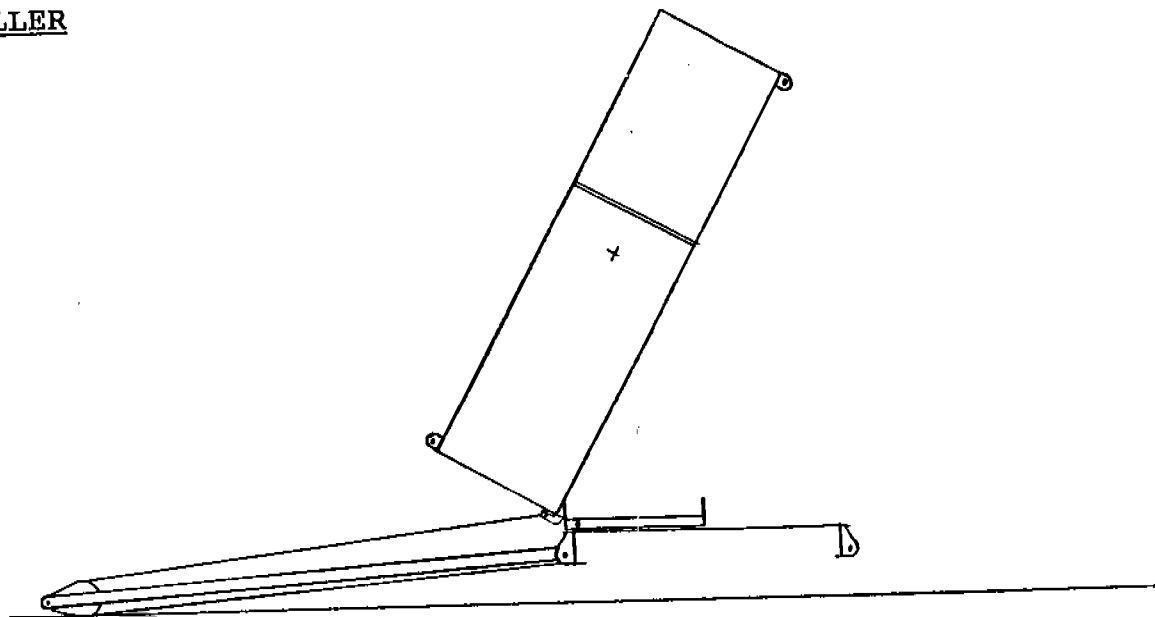
1. While track is in the horizontal position with A-frame cables tight and train is in front (short) track section, turn on key switch on operator control box.
2. Use operator control switches to move train assembly to rear (long) track section.



Remove Front (Short) Track Section Cable

1. Lower front (short) track section cable until A-frame lies on ground.
 2. Position ladder.
 3. Remove pin from front track section cable lug and drop cable.
- NOTE: It may be necessary to raise A-frame slightly to allow enough slack in cable to remove pin.

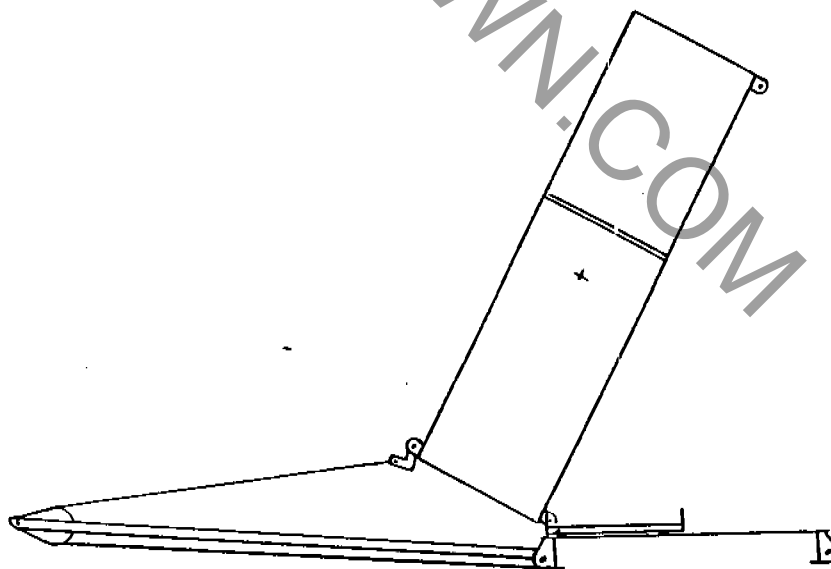
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Position Track To Reattach Cable

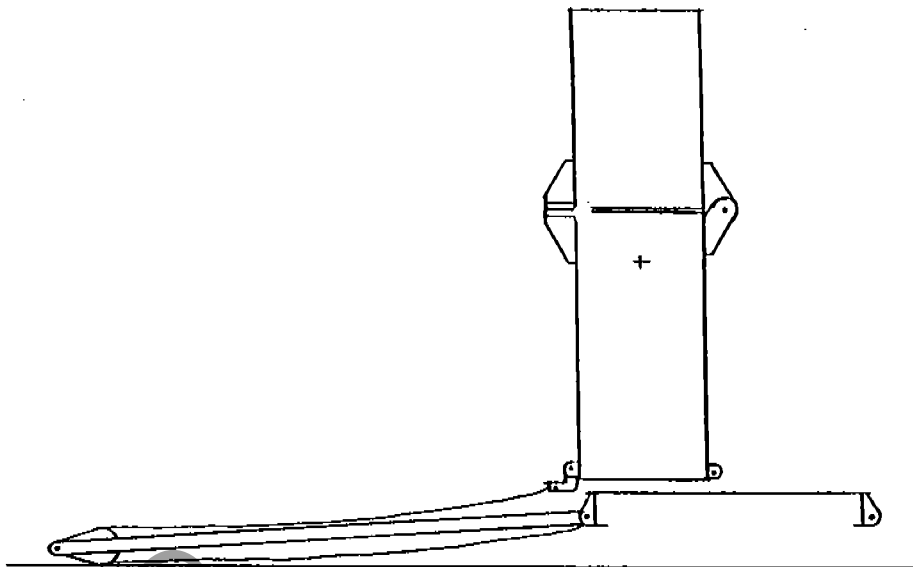
CAUTION: Before lowering the rear section cable, be sure the sign face has been raised to the vertical position. Otherwise, the fan of cards may be damaged when the track moves to the vertical position.

1. Lower rear (long) track section cable until track is at rest against the transport lock lug. NOTE: Transport lock should be in the UP position from Step 1, Page 3.



Reattach Cable

1. Remove cable from inside cable lugs.
2. Pin cable to outside cable lugs.



Position Track Vertical

1. Raise rear (long) track section cable enough to clear transport lock.
2. Pull transport lock pin.
3. Rotate transport lock so that it rests on trailer deck.
4. Lower cable until A-frame lies on ground and cable is slackened.
5. Remove pin from track cable lugs.

TRACK ERECTION COMPLETE

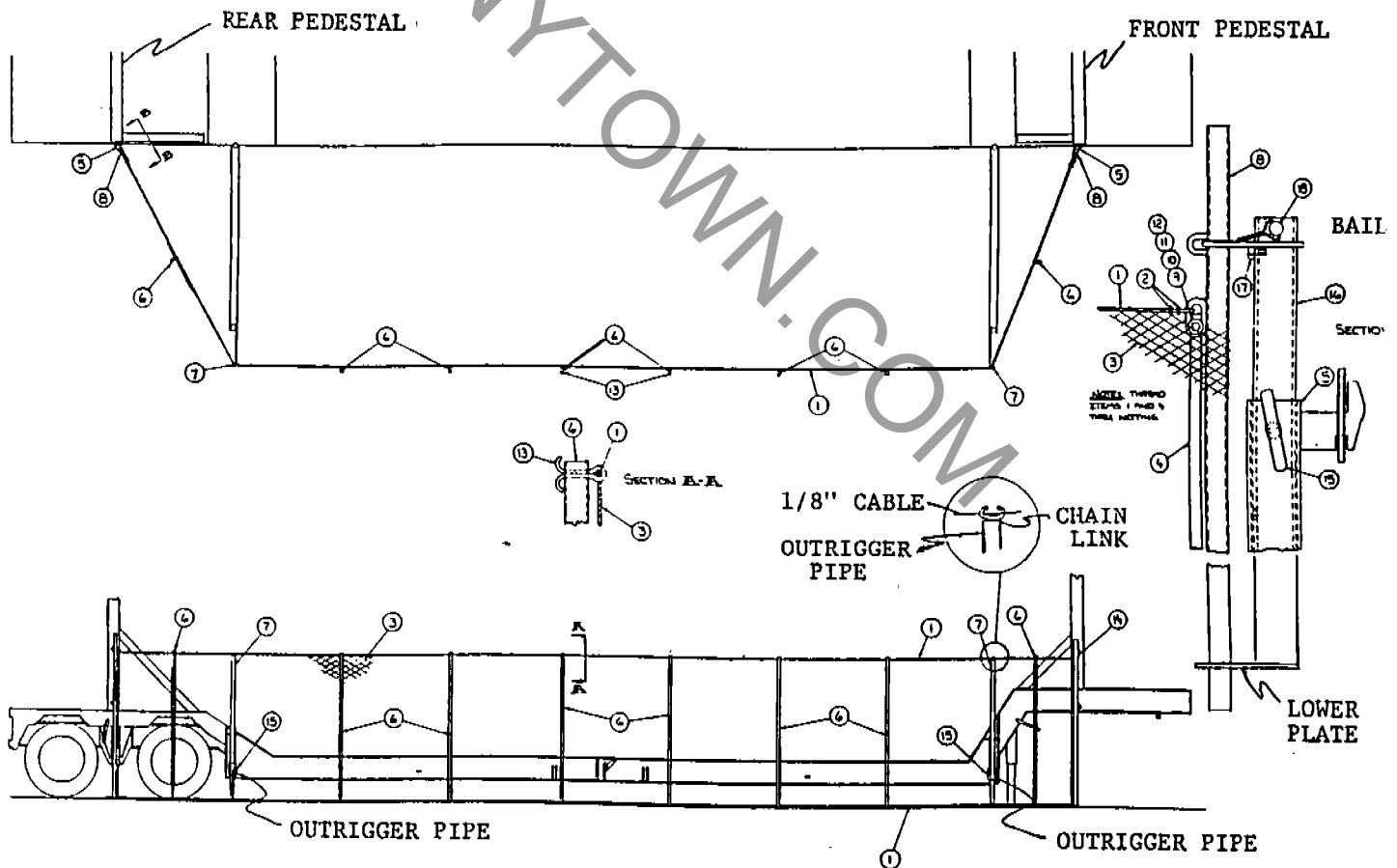
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DISMANTLING PROCEDURES

1. Remove A-frame cables and store under each side of trailer.
2. To dismantle, follow above steps in reverse order. Start with train assembly in long track section. After A-frames and cables are in proper position, tighten until track is in horizontal position, move train to proper parking position, short track section.

CAUTION: Turn electrical power OFF after train is parked.
DO NOT use electrical power to move power units.

3. Set track locks in proper position and lock train assembly.
4. Disconnect rear power unit and move manually to proper position and lock with train locks.
5. Follow assembly procedure steps in reverse order.



L165534 - SAFETY NET ASSEMBLY

INSTALLATION OF SAFETY NET

1. Insert Item 7, outrigger pipe into tube on backside outrigger. Do this on both outriggers.
2. Attach Item 5, mounting pipe, along with Item 16, mounting pipe to lugs mounted on side of pedestals. One assembly to front pedestal and the other assembly to rear pedestal.
3. Starting from either end, attach net assembly by inserting Item 8, mounting pipe, through lower plate on Item 16, mounting pipe.
4. Bring the upper end of Item 8 together with Item 16, and flip bail, on Item 8, over Item 16. Install snapper pin, Item 18, through Item 16, mounting pipe.
5. Roll out netting around to other end of ride.
6. Raise netting to a vertical position.
7. Insert Item 8, mounting pipe, through lower plate on Item 16, mounting pipe.
8. Pull the upper end of Item 8 together with Item 16 and flip bail, on Item 8, over Item 16. Install snapper pin, Item 18, through Item 16, mounting pipe.
9. Return to outrigger pipes, Item 7, and place 1/8" cable through chain link located at each end of the pipes. Check each 1/2" square tube and adjust to vertical position for proper support of net.

The Safety Net Assembly is now complete. If the netting is not vertical and cable is not tight enough, follow the adjustment instructions.

Adjustment Instructions

1. Free one end of safety net by removing snapper pin and lifting bail.
2. Loosen cable clamps, Item 2.
3. Pull cable and tighten cable clamps.
4. Pull the upper end of Item 8, mounting pipe, together with Item 16, mounting pipe and flip bail over Item 16.
5. Repeat Item 1-4 until adequate tension in Safety Net is obtained for upper and lower cables.
6. Install snapper pin, Item 18, through Item 16, mounting pipe.

POWER UNITS

The train is powered by two power units, one at each end of the train connected by means of cushion cylinders (see Page 17). Each power unit has a 10 hp 240/208 volt 3-phase electric motor powering two 18x8.5x8 pneumatic tires. The tires press against a traction plate which is an integral part of the track sections.

Power from each motor is transmitted from electric motor to wheels by V-belt primary and enclosed chain final drive. The reduction is designed to give a maximum train speed of 4 1/2 mph, one trip around the track every 13 to 14 seconds.

Each motor/wheel unit is mounted on a frame which mounts inside power unit frame via four (4) adjusting screws, which adjust tire pressure to traction plate. Tires must be adjusted to provide traction to pull loaded train.

Power for each 10 hp motor is provided through four (4) pick-up arms with sliding brushes that follow inside an insulated track busway mounted inside each track section. The pick-up arms are mounted on a special bracket welded to one rear wheel truck. There are three (3) pick-up brushes for 240/208 volt 3-phase motor power and one (1) pick-up brush for equipment safety ground.

The insulated busway receives power from main control panel through a rotating "slip ring" located on track front rotating axle.

TRAIN

The train consists of five (5) passenger cars. Each car can seat four (4) people, two (2) in each seat. Seats are placed back to back. The passengers are retained in their seats by the lap bolster which is attached to each door. When the door is closed, lap bolster moves into passengers' lap and retains passengers in a safe position. Doors have spring loaded dual latch bars with safety overlap bar and safety pin to retain passengers in all positions. The inside of each compartment has head pads, knee pads, shoulder pads and arm pads for passenger comfort and safety.

Each passenger car shares its main and guide wheels with its neighbor. The cars are joined together with a ball joint type of coupling which assures positive alignment with the track as well as providing the pivot for the train when engaging the curved portion of the track. A safety lug is located at each wheel truck mounting pin to provide a positive link between the cars.

MAINTENANCE

Power Unit

The power units may be serviced by removing two (2) click pins at rear of housing and lifting housing. Gas filled cylinder will assist in raising fiberglass housing and holding open.

CAUTION: BE SURE HOUSING IS PROPERLY CLOSED AND TWO (2) CLICK PINS ARE INSTALLED WITH RING OVER PIN BEFORE OPERATING.

Check belts and belt tension periodically. Replace belts if frayed or worn.

Maintain a tire pressure of 35 to 40 PSI. Tire replacement is accomplished by deflating the tire then removing the five lug bolts. After removing the tire and wheel, place the new tire and wheel in position. Install lug bolts and then inflate the tire 35 to 40 PSI. If tires slip on the traction plate, first check the tire pressure, then if necessary increase the tire load against traction plate. This is done by loosening the four load frame locknuts, rotating adjusting screws to increase load on the tire and then tightening locknuts.

CAUTION: LOCK NUTS AND BOLTS ON LOAD PRESSURE BOLTS MUST BE SECURED BEFORE OPERATION.

Check power collector arms for wear and spring tension. Check collector shoes for wear. Replace shoe if shoe holder is within 1/8 inch of busway. Examine electric wires for wear, cuts, abrasion, or shorts. Replace as necessary.

Couplings and wheels are covered in the train section of this manual.

Train

Check the door linkage for wear. Replace if wear is such that the door does not fit properly or has too much play.

Check the two latch bars and latches for proper operation. If the latches do not operate properly or a spring is broken, repair as necessary.

Check bolster covers for tears and cleanliness. Worn covers may be used, but torn covers which allow the foam rubber discs to come out are not permissible.

Check the couplings for wear. Replace the bushings if wear is greater than 1/16 inch.

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The wheels are equipped with sealed ball bearings, which are lubricated for life. If the wheel bearings are bad or if the wheel is chipped or broken, replace the wheel.

Note: It is recommended that no attempt be made to replace the bearings in a used wheel as improper assembly will result in damaged bearings.

The wheel truck assembly is mounted to the train with a pin/bushing arrangement which can be greased. Use a lithium base (multi-purpose) grease about once a week or more often if the bushing becomes noisy. Overgreasing does nothing but get your ride dirty.

WARNING: TRAIN AND TRACK MUST BE LOCKED IN SUCH A MANNER THAT THEY CANNOT BE SET IN MOTION WHILE PERFORMING THE FOLLOWING MAINTENANCE.

To replace a wheel on the top side of the track, safety train with wheel locks (one on each track). Lift load on wheel truck and insert wooden block between train frame and track. Next remove cotter pin, remove axle bolt, roll wheel out of bracket. Be sure to save spacers on each side of bearings.

To install wheel, reverse above procedure.

CAUTION: WHEEL AXLE BOLT AND NUT MUST BE TIGHT. 100 FT. POUND TORQUE. COTTER PIN MUST BE IN PLACE BEFORE OPERATION.

To replace an inside (lower wheel), train cars must be separated to remove wheel truck. Position train and lock rear power unit with wheel locks (one on each track). Lift load on wheel truck and insert wooden block on each side. Connect one end of come-along to underside of car, forward of wheel truck to be removed, and connect other end to chain looped through back track openings. Tighten come-along until center ball joint connecting pin can be removed, then pull cars apart about 18 inches and install wheel locks on front power unit. Lift load on wheel truck and insert wooden blocks to support car. Remove wheel truck pivot bolt and roll wheel truck along track until unit can be removed from track. Place unit on deck and replace wheels as required.

To install, reverse above procedure.

Note: Be careful to adjust wheel truck pivot bolt nut to allow wheel truck to pivot freely and install cotter pin.

CAUTION: BE CAREFUL TO PREVENT TRAIN CARS FROM ROLLING TOGETHER WHILE SERVICING WHEEL TRUCKS. THE WEIGHT OF THE TRAIN CARS AND POWER UNITS COULD CAUSE SEVERE INJURY SHOULD THEY SLIP AND ROLL TOGETHER.

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To replace a guide wheel, position the train with guide wheel over an opening in back plate of track. Install four (4) wheel locks (2 each power unit - one each track). Loosen lock nut and set screw two (2) turns on inside of wheel truck just above axle bolt hex head, then remove axle bolt, then slide wheel assembly out of housing.

To install guide wheel assembly, reverse above procedure being careful to use special lock washer on axle bolt, and tighten to 100 ft. pounds torque, then tighten set screw and lock nut.

SPECIAL NOTE FOR SERIAL NOS. 1, 2, & 3

To replace guide wheel follow instructions above (to replace inside wheel). After wheel truck assembly has been removed, use 1/4" pin punch to remove roll pin, then use special puller to remove guide wheel axle. Install new wheel and spacer assembly. Insert axle with roll pin holes aligned. Drive axle into housing and insert roll pin. Then replace wheel truck assembly.

CAUTION: BE CAREFUL ALL BOLTS, NUTS AND COTTER PINS ARE PROPERLY INSTALLED. SAFETY IS A MUST!

Cushion Cylinder

A cushion cylinder is used to connect each power unit to the train, thus two (2) cylinders are used. The cushion cylinders are built with a piston in the center of the barrel and a load spring on each side of piston. During assembly, all the air is bled from cylinder and hoses, then connected to an empty accumulator. After assembly, hydraulic oil is pumped into the accumulator via the Schrader valve until a pressure of 200 psi is reached. Field Service is only required when cylinders are leaking or spring is broken. Consult factory for additional instructions.

CAUTION: THE SPRINGS IN CUSHION CYLINDER ARE UNDER PRESSURE. PROPER PROCEDURE MUST BE FOLLOWED FOR SERVICING TO PREVENT POSSIBLE INJURY. CALL FACTORY BEFORE ATTEMPTING SERVICE.

TROUBLESHOOTING LIGHTING CIRCUITS

1. Troubleshoot this system by sections. Section 1 is the logic, or sequence, or pattern section. Section 2 is the A.C., Solid State relay or output section. Section 3 is the 5 volt bias power supply, which provides 5 volts to both section 1 and 2.
2. Most problems will be in the section with the most power flowing through it (power = volts x amps) or section 2 including ceramic fuses and breakers. TO ISOLATE SECTION 1 FROM SECTION 2 AND TO TURN ON ALL LIGHT CIRCUITS, REMOVE THE 2 PHONE CABLES FROM MAIN BOARD. When unplugged, they should turn on solid state relays and all lights. Did they all light up? If yes, look at Logic Troubleshooting. If none of them at all came on, look in two places -- power input to system and 5 volt supply.

Some came on, some stayed off, tells me that you have at least one good circuit. There are 6 or 8 identical circuits. Each circuit output will measure 240/208 volts A.C. on the pair going to the ride. You can locate these wires on terminal strips on the bottom left of panel on Super Loop, or on fuse blocks in box on track of Hi-Roller. Wire colors are #1=Blue, #2=Black, #3=Orange, #4=Gray, #5=Red, #6=Purple, #7=Green and #8=Yellow.

The solid state relays will measure less than 10 volts A.C. between terminal #1 and #2 turned on and in the off state 240/208 volts A.C. across the same terminals. Control voltage is applied to terminals #3 and #4. The on state = 3 to 5 volts D.C. The off state is less than 1 volt D.C. across the same terminals.

If terminals #1 to #2 measures 240/208 volts A.C. with phone plugs pulled, measure control voltage on terminals #3 to #4 - if over 3 volts D.C. relay is bad. No 3 volts, check 5 volt supply and bias resistor on power supply board and the small wires from relays to bias power supply.

3. Is the problem in the control panel or in the ride wiring? This Quick Check will determine if it is or not. Unplug phone plugs (which turn circuits on), measure each circuit pair leaving panel going to ride (colors=1-6 or 8). If they all read 240/208 volts A.C. between each color pair, problem is in the ride, not in the panel or box. Note terminal strips are location of wire pairs, (left=rear section, right=front section) on Super Loop panel. Hi-Roller look at fuse-blocks for color pairs.

If all color pairs did not measure 240/208 volts A.C., troubleshoot that color or colors circuit in panel. Check solid state relay, ceramic fuse, breakers.

4. Troubleshooting ride wiring - Lights flash, some don't turn completely off, check wire pairs leaving panel as in 3 above.

Remove fuse on 5 volt supply. This removes 5 volts from control wires on S.S. relays which turns them off. Terminals #1 to #2 will read 240/208 volts A.C. Light should not be on. If lights are on dim, you have a short to case ground in the ride or panels.

Work one circuit at a time until you clean them up. Break it in half and in half again until you find the short. Relay may not read all of the 240/208 volts on the circuit that has the short to ground.

5. Logic Troubleshooting - Does the LED flash or stay on? It indicates clock circuit is working and 5 volt supply is also working. Does any circuit flash? If yes, pull phone plugs. Did all circuits work? If yes, switch the phone plugs and plug back in. Does the problem move? If yes, switch them back. Now change IC chips, IC chip U4a and U4b. Does the problem move? If yes, one of them is bad, U4a controls circuits #1-4, U4b controls circuits #5-8. If no was the answer to any of the above questions, check phone plugs and connectors.

OPERATOR INSTRUCTIONS

1. Operator should have basic training in general safety rules and procedures.
2. Operator should familiarize himself with all the controls, i.e. start/stop switches for 40 h.p. hydraulic pump motor, for track rotation. Forward/reverse/stop switches for train operation. Joystick with safety lock collar controls forward and reverse rotation of track.
3. Operator should understand usage of photoelectric safety sensors, bell, siren, safety gate bar and operator safety seat.
4. Before operating, operator should be trained and understand the main power disconnect switches.
5. Before operating, operator should be trained and understand car door latching and use of safety snap pin, loading and unloading procedures.
6. Operator should check all footings, outriggers, blocks, safety netting, seat cushions, lap rollers, head pads, knee pads, door latches, safety pin, connecting joints, wheels, axles and general condition each day before electrical power is turned on.
7. Operator should complete above inspections and see that any and all components have been properly repaired and/or adjusted.
8. Before starting the ride, operator should make sure there are no personnel around or in ride structure or exposed to any electrical components, or any other areas where injury could occur.
9. Operator should complete above instruction and then start 40 h.p. hydraulic pump motor and allow to operate for 5 minutes to warm up hydraulic system, then start train and rotate 5 or 6 rounds in each direction as a test of all circuits, train, pump, latches and operation in general. When all of the above are okay, then ride is ready for passengers.
10. Before loading passengers, track must be stopped with steps on track facing loading platform (front side) and train stopped in mid section of track with power off.
11. To load pull safety click pin, rotate handle until safety bar clears pin, then pull handle until latch bars clear latch plate, lift door until gas cylinder stops door and holds open. Repeat for each door and each car.

HI-ROLLER

12. Load riders and close doors, make sure both doors are properly closed and all latch bars are properly engaged in latch plates and safety click pin is above safety latch bar. Repeat each car.
13. While loading, operator should instruct riders to keep knees together, place hands on hand rail as door is closed. This will prevent injuries.
14. Before starting operator should check that loading deck is clear of any personnel, entrance and exit gates are closed, safety gate to operator cabin is closed and operator is properly seated in operator seat. Look in mirror to be sure back side of ride is clear.
15. Turn key switch on, start 40 h.p. pump motor. Press forward or reverse train start switch and as train reaches full top position lift safety collar on joystick (loop rotation lever) and move all the way forward. This will cause train to have sensation of falling toward crowd. Opposite movement of handle will cause opposite track rotation.
16. To stop ride, release loop rotation lever and allow loop to slow down with step side of loop toward loading ramp and train enters bottom section of loop, press train to stop button and allow ride to come to a complete stop before unloading passengers.

CAUTION: Operator should not allow a passenger on the ride that cannot be properly secured by lap roller.

Operator should not allow a woman who is pregnant, or a person visibly ill, or under the influence of drugs or alcohol or any other person who might be injured due to motion of the ride or restraining devices.

CAUTION: Operator must be physically and mentally alert and in full control of the ride during loading, operation and unloading of the ride.

Operator must give full attention to the safe operation of the ride and the safety of all passengers.

CAUTION: Operator must remain in operator seat and in proper position to use all controls while ride is operating.

SAFETY FEATURES

Many safety features are incorporated on the Hi-Roller. These include:

1. Operator safety gate must be closed and operator must be seated in operator seat, otherwise ride cannot be started. The ride will stop automatically should the operator leave the seat or open the safety gate.
2. An alarm will sound in operator cabin should anyone pass through photoelectric sensor beam across outer section of loading/unloading platforms.
3. A safety net has been provided, inside of the perimeter fence, as means to prevent persons from entering the path of the rotating ring.
4. A large mirror has been installed so operator can look along back side of ride.
5. Operator has a switch to sound bell to alert personnel of intentions to start ride.
6. Passenger compartments have dual latch bars and overlapping linkage with a click pin for compound safety. Each compartment has cushions to prevent abrasions, and a restraint system for rider safety at all times.
7. Safety links are provided between the cars and power units as a back-up safety system.
8. The electrical system has 5 wires with a common and earth ground. All circuits are protected by circuit breakers sized for load conditions. There are two main disconnect panels with overload and ground fault breakers. One controls controls lights, second controls ride operation. Operator controls are located within normal reach. System requires a key to be inserted and turned to allow initial start up.
9. The hydraulic system consists of two systems. The 7-1/2 HP gear pump is used for erection and dismantling only. The 40 HP Sundstrand variable displacement pump provides power for forward and reverse rotation of the track. Two 10 hp motors provide power for train forward and reverse rotation.

Every effort has been made to conform to the safety codes of many states and the standards of many professional societies, such as AWS, ANSI, NEC, ASTM, ASME, NFPA, ASM, and other national and state standards in effect at the time of manufacture.

Field modification or lack of maintenance may alter the above conditions.

The Hi-Roller Company