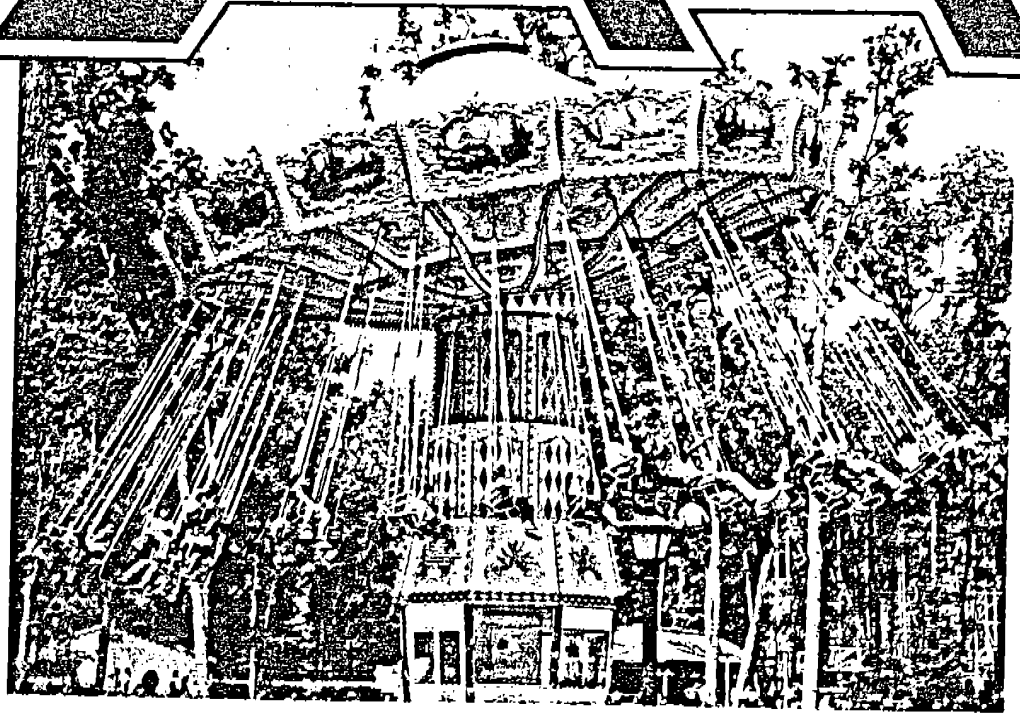
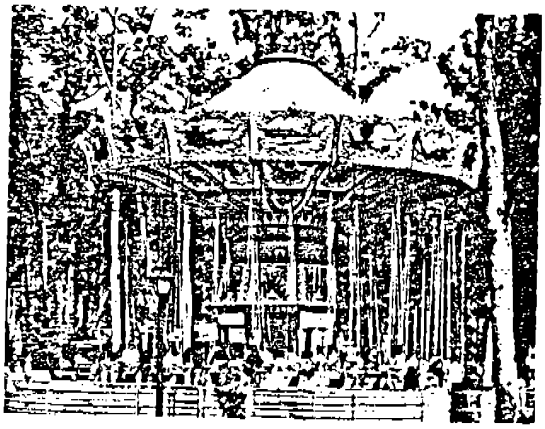
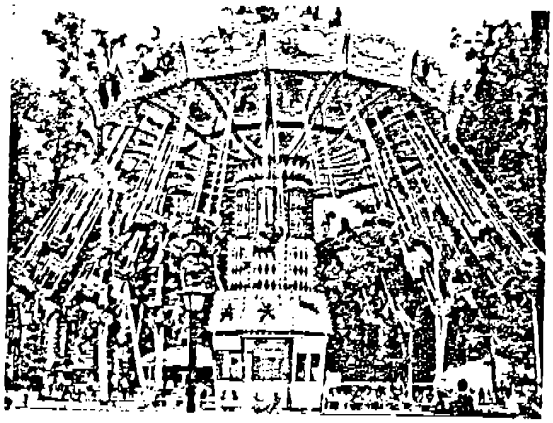
MFG: ZIERER
NAME: WAVE SWINGER
TYPE: NON-KIDDIE

# ZIERER



# WAVE SWINGER



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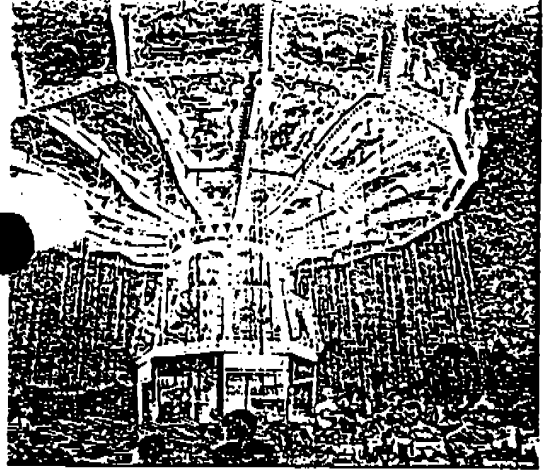
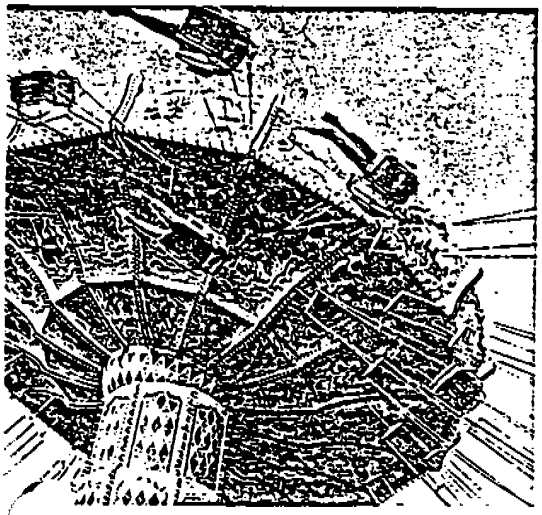
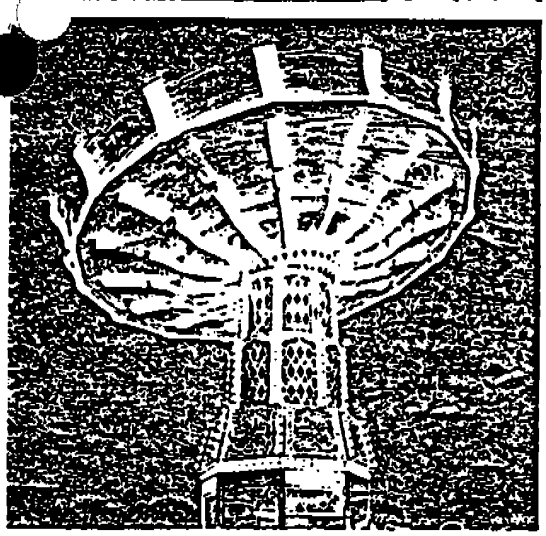
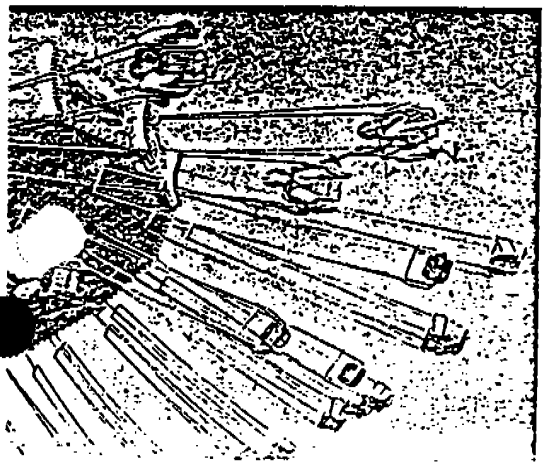








Ein unvergleichliches Fahrvergnugen, das Zuschauer und Fahrgaste gleichermaßen begeistert! Ein Spaß für alle Jung- und Junggebliebenen! Erleben Sie – in einem Stuhl schwingend – die einzigartige oszillierende Wellenbewegung! Lieferbar in Park- und mobiler Ausfuhrung.

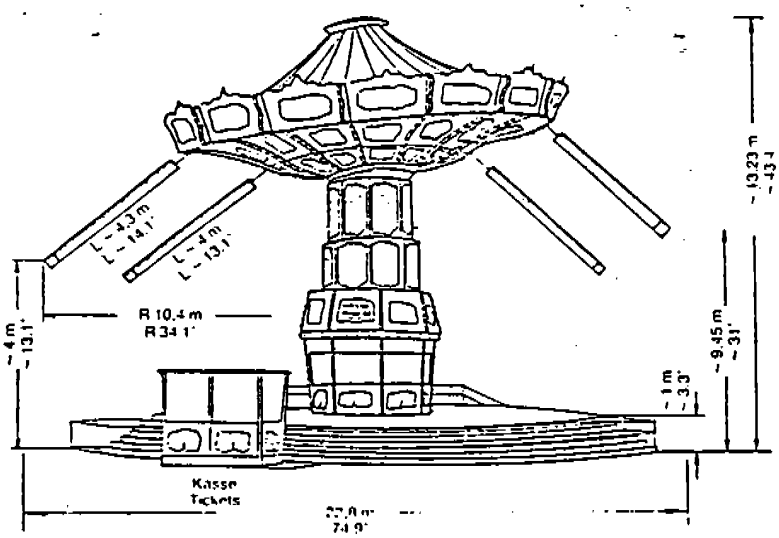
**TECHNISCHE DATEN:**

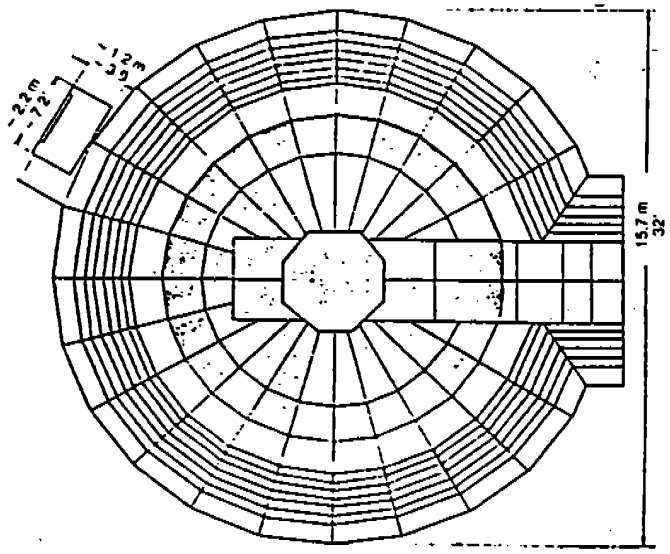
| | |
|---|---|
| Grundriß | 15.7 m Durchmesser |
| Flugweite | 22 m |
| Flughohe | 9.45 m |
| Fahrplätze | 48 Einzelsitze |
| Kapazitat | 1200–1400 Fahrgaste/Std. |
| Anschlußwerte | Antrieb 60 kW<br>Licht 55 kW max. |
| Fahrablauf | Automatisch oder manuell |
| Gestaltung | Barockstil, handgemalt: Gestaltung auch nach Wunsch |
| Packmaße | 12 t Mittelbaurahmen<br>16 t 40 Fuß Container |
| Option | Separate Hydraulik installiert außerhalb der Betriebszone, nur bei Parkmodellen. Motive nach Kundenwunsch. |

*This magnificent ride is entertaining to view besides being great fun to ride. Brings enjoyment to the young and all those who remain young at heart. A chair swing ride made unique by its oscillating wavelike motion. Available as Portable and Park models.*

**TECHNICAL DATA:**

| | |
|---|---|
| Ground Dimensions | 52 foot diameter circle |
| Aerial operating dimens. | 72 foot circle<br>31 feet in the air |
| Seating | 48 individual swing seats |
| Hourly capacity | 1200–1400 riders |
| Electrical requirements | 60 kW Drive<br>max. 55 kW Lighting |
| Electrical components | UL or CSA approved |
| Operating Sequence | Automatic or Manual |
| Theme | Baroque Bavarian with handpainted scenery; customized painting theme available |
| Transport | 12 ton centre frame and 16 ton 40' cnt. |
| Optional | Isolated hydraulic unit positioned away from the operating area. Park models only. Special Custom Paint schemes. |





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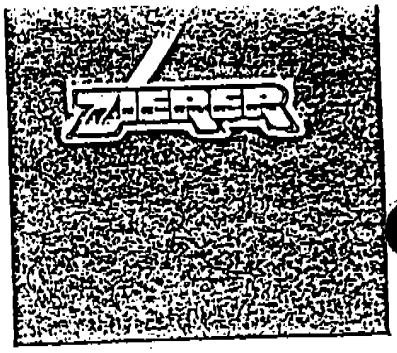


## WAVE SWINGER: GENERAL STATISTICS

The following is a rundown of general information and statistics that will help familarize personnel with the WAVE SWINGER.

### SEATING:

| | |
|---|---|
| Number of carriers | 48 seats |
| Maximum number of passengers per carrier | One (1) |
| Maximum number of passengers per cycle | 48 |
| Maximum passenger weight per carrier for testing entire ride. | 170 lbs. |
| Maximum total passenger weight should not exceed | 8000 lbs. |
| Maximum passenger weight (absolute). | 230 lbs. |
| Minimum rider height | 42 inches |

### PERFORMANCE:

| | |
|---|---|
| Direction of travel | Basket (riders) Clockwise<br>Tower (Mast) Counter-Clockwis |
| Speed. | Basket (riders) 9-11 Rpm<br>Tower (Mast) 5-6 Rpm |
| Theoretical Capacity per hour. | Using 2.5 minutes for complete loa ride and unload= 1152 riders per h |
| Cycle time for ride sequence | 0-240 seconds |
| Recommended Cycle time for ride sequence | 1.5 minutes |
| Maximum allowable wind speed for operating | 40 Mph |

THE WAVE SWINGER SHOULD NOT BE OPERATED IF LIGHTNING IS IN THE AREA. RAIN IS NOT A PROBLEM BUT COMMON SENSE SHOULD BE USED.

Ride patrons should always be advised not to twist Chair Chains, no hand holding, and no pushing off between riders.

### DIMENSIONS:

| | |
|---|---|
| Maximum height, from platform to top of decoration at full extension | 43.4 feet |
| Maximum swing of chairs. | 68.2 feet |
| Maximum height of chairs during operation. | 27.7 feet |
| Lowest height of chairs during operation | 9.8 feet |
| Total movement of Basket from load/unload position to full extension. | 9 feet |

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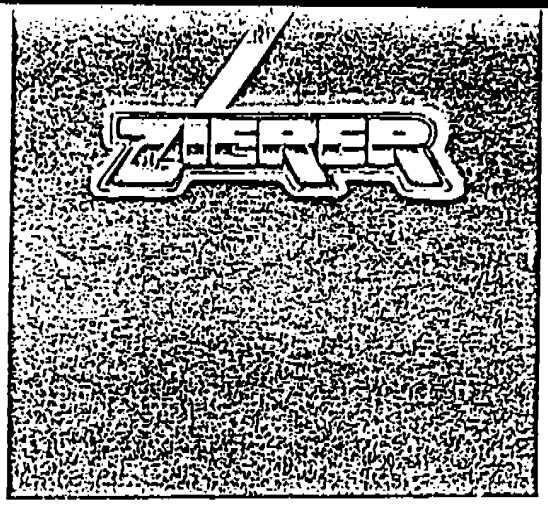


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# WAVE SWINGER:

## GENERAL COMPONENTS DESCRIPTION

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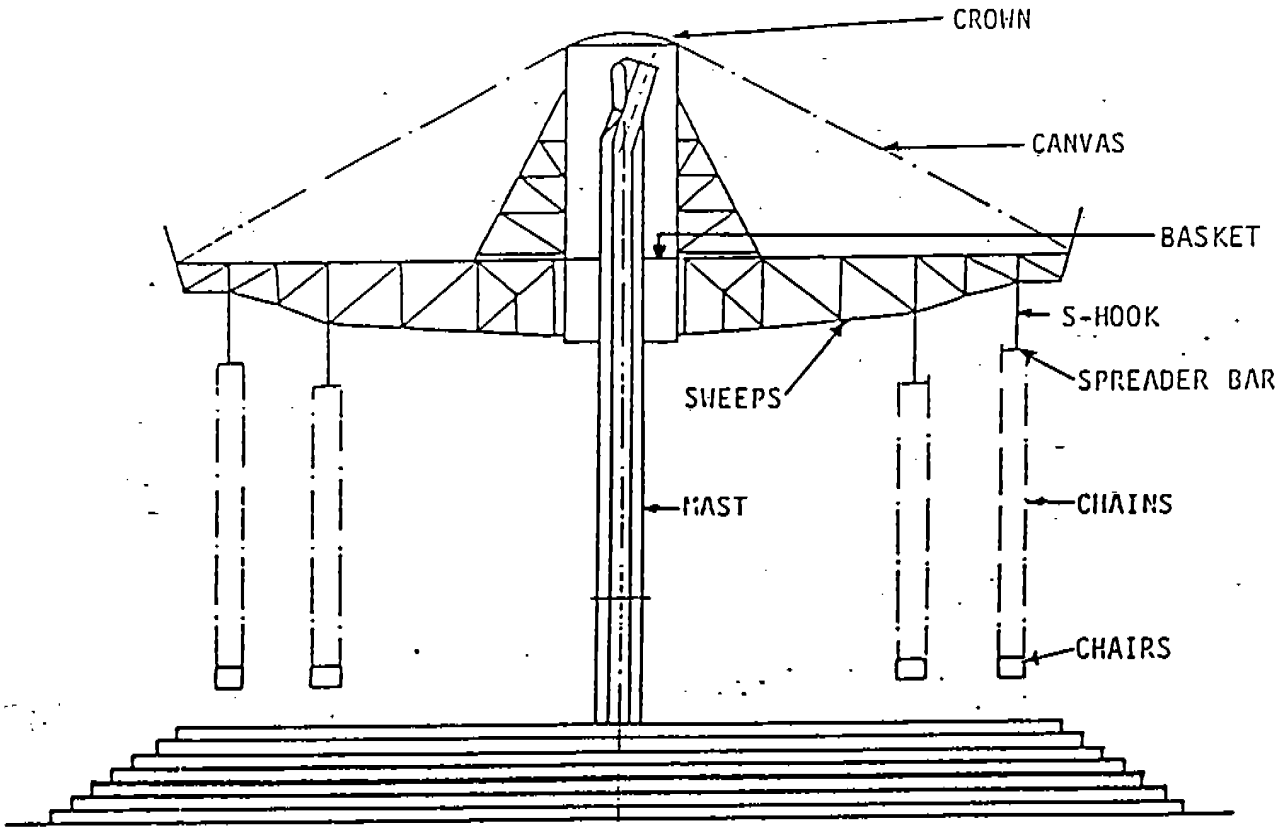

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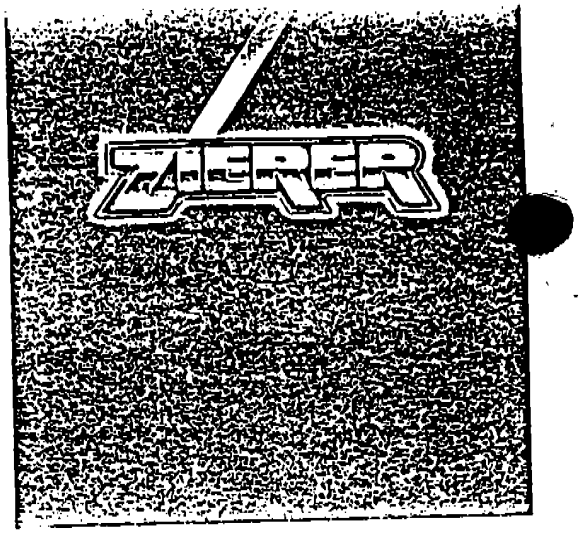


WAVE SWINGER
GENERAL DESCRIPTION OF RIDE SEQUENCE

| Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date: |
|---|---|---|---|

Operator manually sets timer to desired number of seconds for ride cycle. Depress and hold down the "TIPP" button causing the upper basket to slowly rotate allowing operator to look at all passengers making certain that all lap bars are in place and that all through-the-leg restraints are fastened. Release "TIPP" button and depress first "CLIMB" then "TURN". This instigates the beginning of the Automatic Ride Sequence. The upper basket will geing to climb and then by it tripping lim switches, the other functions are brought into play. The basket rises then beg to rotate and once the basket has climbed to a certain point up the mast, the mast itself begins to rotate in the opposite direction from the basket. When the basket attains its fullest ascent into the curved or bent section of the mast this creates the wave or oscillating effect which is the trademark of the ride. When the timer runs to zero seconds, the ride automatically shuts off allowing the basket to desce the mast into the unloading/loading position. As the basket descends the mast the limit switches are again tripped, shutting off the tower rotation and at its lowest position the basket rotation, at which time the operator may apply the foot brake to halt the free spinning of the basket. When the ride is completely stopped the riders may safely leave their seats and a new ride cycle is ready to begin. The operator has only manual control of the lights which he causes to alternate by depressing the "RED" or "WHITE" buttons on the control panel. Please note it is only possible to illuminate half of the lamps at one time. The contactors in the electrical panel will automatically disengage one set of lights when the other set is desired to be illuminated.

Total manual operation of the ride is possible, but for safety reasons and to allow consistent high hourly capacity, it is not recommended.

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# WAVE SWINGER
# RIDE OPERATIONS CONTROL SYSTEM DESCRIPTION

| Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date: |
|---|---|---|---|

The operator's control panel consists of a key switch for main power on, manual button with indicator lamp for main hydraulic pump on, timer which is set manually for the ride cycle, emergency "OFF" switch allowing immediate halting of the ride sequence, hydraulic oil lever indicator lamp, manual button for turning on white lights, manual button for turning on red lights, manual button for all lights off, manual button "TIPP" for slow rotation of upper basket when in unload/load position, manual button "OFF" for manual stopping of ride sequence, manual button "TOWER" for rotation of tower causing the oscillating or wave effect, manual button "TURN" for rotation of upper basket from which are suspended the swing seats, and manual button "CLIMB" for beginning the ascent of the upper basket up the tower to full height.

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# WAVE SWINGER

## OPERATING PROCEDURE

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Initial Testing After Set Up and Ride Operating Procedures:

1) Turn on Main Switch located on large electrical panel at rear of Operator's Control Booth.
2) Check 3 phases via meter located on large Electrical Panel.
3) Turn on Light Switch located on large electrical panel at rear of Operator's Control Booth.
4) Emergency Switch located on Operator's Control Panel must be in "OFF" posi[redacted].
5) Turn on Key Switch.
6) Position 2 mechanics to watch rotation of large Hydraulic Pump and Motor.
7) Press "Pump On" button I M P O R T A N T!!! Note rotation of Pump and Motor. Change electrical leads if not correct.
8) Note "Oil Control" light. If oil level is not sufficient, Pump will not switch on.
9) Press light button "Red" then "White". Corresponding light strips should be illuminated when activated. Correct light connections as necessary to illuminate proper colors. NOTE!!! When one color is turned on other color will automatically turn off.
10) Manually set Timer providing number of seconds for actual ride duration.
11) Depress and hold "Tipp" button causing slow rotation of Basket. Visually check that all Lap Bars are down and in proper position.
12) Depress "Climb" button then "Turn" button. This instigates the beginning of the automatic ride sequence. The Upper Basket will begin to rise and then by tripping Limit Switches the other functions are brought into play. The Basket rises then begins to rotate, once the Basket reaches a certain point on the Mast, the Tower/Mast begins to rotate in opposite direction

continued...

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WAVE SWINGER
OPERATING PROCEDURE



Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date:

from the Basket. When the Basket attains its fullest ascent up the Mast and is tilted over and due to the Basket rotating clockwise and the Tower/Mast rotating counter clockwise, the oscillating or wave effect is produced.

13) When the "Timer" runs to zero, the ride automatically shuts off allowing the Basket to descend the Mast into the unloading/loading position. As the Basket comes down the Mast, the Limit Switches are again tripped shutting off the Tower rotation, Basket rotation, and at its lowest point flow of Hydraulic Fluid completely.

14) When the Basket Rotation is disengaged, the Operator may at that time gently depress the Foot Brake easing the ride to a complete stop. NOTE!!! Quick hard application of the Foot Brake may cause chairs to bump together causing minor injuries to riders.

IMPORTANT!!! Check function of Hydraulic Oil Coolers' Radiators; they must switch on automatically when the fluid temperature reaches 35 degress Celsius or approximate 98 degress Farenheit.

The WAVE SWINGER is now ready for public operation. The following is an outline of procedures routinely followed when all functions have been preselected and the attraction is being operated in the automatic mode.

1) Emergency Stop button - OFF
2) Key Switch - ON
3) Hydraulic Pump - ON
4) Depress - Climb then Turn
5) When ride completes sequence and Basket has returned to the load/unload position - Gently apply Foot Brake
6) Repeat steps 4-5 for continuous repeat operation

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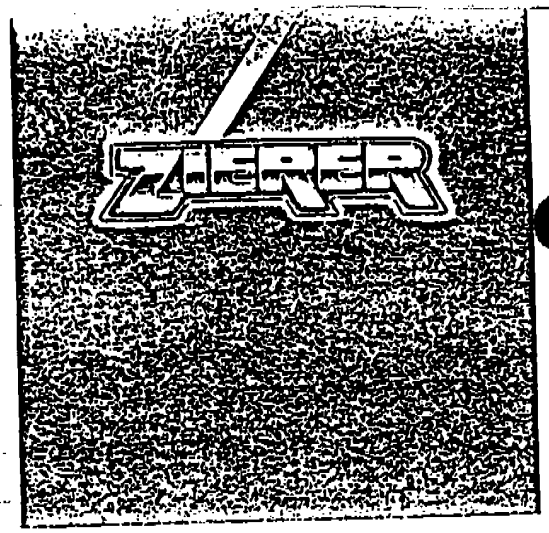


WAVE SWINGER

EMERGENCY PROCEDURES

Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date:

There are two types of emergency situations encountered while operating amusement ri

1) The first type requires that the ride sequence be shortened or ended immediatel but the ride may be allowed to come to a stop in the normal routine manner. Mer press the OFF button on the control board and the WAVE SWINGER will cycle down into the load/unload position. Apply the foot brake as required to bring the r to a safe and gentle stop. This emergency situation usually occurs when a [redacted]'e becomes ill or wants off the ride badly and appears to be on the verge of [redacted]c

2) The second type requires that the ride be brought to a hault absolutely as soon as possible. There is a situation that exists that may cause injury to either riders and/or by-standers.

A) Hit the Emergency Stop button. The WAVE SWINGER Basket will continue to free rotate but is not under power.

B) After the Basket has slowed to a reasonable rate, gently apply the foot brake, easing the Basket to a stop.

C) Reassure all riders, ask them to remain calm and to NOT TO ATTEMPT LEAVING THEIR CHAIRS.

D) Remove or correct item or situation that has caused the emergency situatio if possible. Ex: A child has entered the ride operating area and is look ing up at the people on the ride while the ride is in full motion. Remove the child to the proper safety area.

E) Release the Emergency Stop button.

F) Press the OFF button and hold it down. The ride will stop descending whenever the OFF button is released. Hold the button down until the [redacted]ke returns to the load/unload position.

G) Evacuate riders and complete correction of situation if required.

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# SAFETY AND MAINTENANCE GENERAL GUIDELINES

| Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date: |
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Before any work is performed on any ride, a few general rules of safety and common sense should be reviewed and adhered to by all personnel.

1. All work must be done by competent, qualified mechanics capable of understanding the proper operation, installation and adjustment of all components.
2. Generally inspect the entire ride each day of operation to determine that no unsafe conditions are developing and that no components have been removed or altered by ride operators.
3. Perform all manufacturer's recommended maintenance in accordance with all intervals and procedures set forth in Operation and Maintenance literature using the following areas as a general guideline:
   - A. Security of ride to foundation or integrity of blocking system supporting ride.
   - B. Placement, wear and security of all pins and safety clips.
   - C. Check all bolts for tightness and for proper torque when indicated.
   - D. Hydraulic and Electrical systems.
   - E. Lubrication of specified components.
   - F. Inspection, adjustment and service of all mechanical devices.
   - G. Passenger restraint and safety system.
   - H. Operator Controls and Emergency Stop System/Controls.

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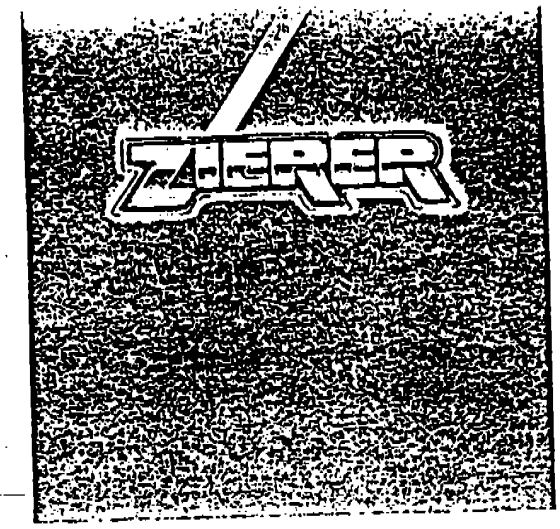


# SAFETY AND MAINTENANCE GENERAL GUIDELINES



Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date:

4. Review each job carefully to determine hazardous situations that may be present and take necessary safeguards before beginning work.
5. Carefully examine all tools and equipment to be used and make certain they are in safe operating condition.
6. Use the proper tool for each job and only in the manner it is designed for.
7. Wear proper clothing that is suitable for the work intended. Avoid items such as necklaces and jewelry that may become lodged in moving parts or come in contact with live electrical service.
8. Protect your eyes by wearing approved safety glasses or goggles.
9. Wear hard hats at all times. When working in elevated areas, use a safety belt.
10. When working in hazardous situation, such as around live electrical circuits, the buddy system should be incorporated.
11. Any shields, guards or inspection plates removed during maintenance must be replaced upon completion of job.
12. Thoroughly clean work area and ride after completion of job and dispose of surplus material.
13. Record all parts replaced on the ride. Notification to the manufacturer should be made of any item or condition that must be replaced, repaired or corrected frequently and that seems out of the ordinary in occurance.

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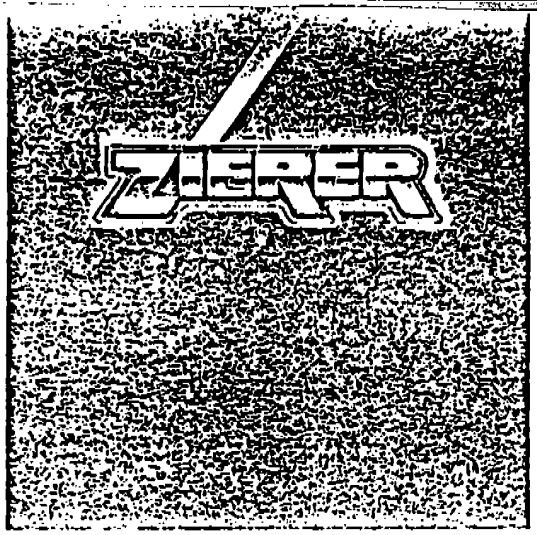


# TELEPHONING FOR ASSISTANCE

| Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date: |
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We are only too happy to render as much assistance as possible to our valued customers. There are a few basic steps that will greatly assist us in helping you diagnose a condition that exists or a malfunction that is occurring. Please try and follow these simple steps when phoning for assistance.

1) Make a simple but exact and accurate list of what the ride is doing, thus failing to do.

2) Does the malfunction or situation occur only in the automatic, manual or both in automatic or manual mode?

3) How long has situation existed before asking for assistance?

4) What exactly has been adjusted, changed or modified to diagnose or correct problem?

5) If no change occurred by making adjustments, have all components been returned to their original position?

6) Does the malfunction always occur when the ride is in a certain position or does it vary?

7) Have the same person that is actually working on the ride make the call and report the problem or at very least have that person immediately available to discuss situation. Too much is mis-communicated or left out when information is being passed through several people.

8) Have complete street address and zip code of your current location in hand so that repair kits or replacement components may be expedited to you.

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# WAVE SWINGER
# MAINTENANCE INSTRUCTIONS

| Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date: |
|---|---|---|---|

I M P O R T A N T!!!  C A U T I O N!!!  D A N G E R!!!

All electrical power must be switched OFF, otherwise electrocution is possible.

## DAILY MAINTENANCE:

1) Beginning with the Crown, make sure all nuts and bolts attaching Crown to Canvas Support Ring are tight. Also make sure electrical cords from Fancy Crown are secure and clear of Mast Top.

2) Grease with top quality bearing/axle grease the Lift Cable Pulley located at the Mast Top. Do not forget to grease fitting located inside Mast.

3) Visually check that all L-Pins and Safety Pins are in place and properly secured.

4) Visually check that no foreign objects have fallen inside Basket Center and in danger of becoming lodged in Gear/Bearing teeth.

5) Visually check for any oil seepage from Hydraulic Basket Drive Motors or hoses.

6) Visually check all electrical connections of light strips.

7) Check tension of wire rope Cross Brace Cables, tighten turn buckles as required.

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WAVE SWINGER
MAINTENANCE INSTRUCTIONS



Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date:

8) Check tension of Canvas Top, turn hand cranks as required.

9) Check electrical Brushes and Collector Rings inside Basket Center. NOTE!!! Should you hear a howl or screech while ride is operating, it may be the Collector Rings. Grease with vaselin

10) Grease Ring and Pinion Gear located inside Basket according to Instruction Sheet KD 114-1 enclosed.

11) Grease Upper Basket Bearing according to Instruction Sheet KD 114- enclosed. Grease nipples are normally found on underneath portio of bearing.

12) Grease the 4 Outer Basket Guide Rollers.

13) Grease the 4 Inner Basket Guide Rollers.

14) Using spray type non running grease, grease the Guide Track surfaces as required. NOTE!!! Grease only when needed and wipe away as much excess grease as possible. Over greasing will cause messy droppings inside Control Booth. Grease only portion of Guide Track that Basket Guide Rollers move on during normal operation.

15) Visually inspect Lift Cables looking for broken strands or deterioration of cables.

16) Visually inspect Lift Cable Shackles and attachment Pins.

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WAVE SWINGER
MAINTENANCE INSTRUCTIONS



Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date:

17) Check tightness of bolts securing Dome Shaped Fiberglass Panels to Basket Sweeps.

18) Visually inspect Rubber Basket Stop Bumpers for deterioration of Rubber Bumpers.

19) Visually check all Hydraulic Hoses running from Basket to bott of Center Mast.

20) Visually check all electrical cord connections for Light Strips located on Tower Panels.

21) Visually check Sliding Portion of fiberglass Tower Panels, lubricate with silicone as required.

22) Visually check Nylon Rubbing Blocks that slide in Mast Guide Trac

23) Check tightness Tower Panels Stop Brackets that lower Tower Panel rest on when Basket is in load/unload position.

24) Remove Wooden Tower and Gear/Bearing covering.

25) Grease Tower Ring and Pinion Gear according to Instruction Sheet KD 114-1.

26) Grease Tower Bearing according to Instruction Sheet KD 114-1. Grease Nipples located on side of Bearing just underneath Ring Gear Teeth.

27) Visually inspect interior of Control Booth all lighting conne o etc. Keep area free and clear of all trash and debris.

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# WAVE SWINGER
# MAINTENANCE INSTRUCTIONS



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28) Make certain no tools or other items remain in Upper Basket. Besides being dangerous, it is very noisy when they roll around on the fiberglass scenery panels.

29) Replace wooden Tower and Gear/Bearing covering.

30) Check Oil Level in Hydraulic Tank. Normal level is 10-1/4 inches from bottom of Tank, minimum allowable is 8 inches from bottom of tank.

31) Check Blocking of Center Trailer and Platform Jackstands. Shim as needed.

32) Visually check condition of platform and steps in general.

33) Check that all fencing is secure.

34) Visually check condition of all fiberglass scenery panels and light strips.

35) Visually check that all Safety Pins are in place on all S-Hooks.

36) Visually inspect all Spreader Bars, Chains, Chairs, Lap Bars and Plastic Chair Inserts.

37) Test Run ride listening for any abnormal sounds that may indicate problems.

38) Test Run ride and visually check blocking this time looking for abnormal or excessive movement.

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39) Test Run ride this time with mechanic positioned far enough away to clearly visually check Canvas Top and Fancy Crown if so equipped looking for abnormal movement in Crown also looking to make certain Canvas Top is buckled, snapped, laced and secured properly. Also note any abnormal movement in light strips and Scenery Panels around edge of Basket.

40) Switch on all lights and visually check for burned out bulbs, replace as necessary.

WAVE SWINGER is now ready to open to the public.

# WELLEN FLUG

**RIDE SPECIFICATIONS:**

One center structure with bottom frame, foundation, main tower mounted onto frame/ball bearing connection. The tower section is powered by two 50 HP hydraulic motors. Installed into the main tower is the primary hydraulic lift cylinder and all necessary slip rings for the (tower top) basket drive. The top of the ride consists of 16 supporting arms with connecting struts for the installation of the hand painted fiberglass scenery and light stringers. The tower basket is powered by two 25 HP hydraulic motors. Hanging from the tower top are 48 stainless steel seats suspended by 4 chains each. Sliding safety bars keep passengers securely in place. Hydraulic unit with motor, pumps, oil tanks, oil coolers, complete valve and control systems installed on separate frame: measurements 1 m × 2.20 m × 1.82 m (3'4" × 7'4" × 6') to be positioned away from the operating area.

Electric panel board to be installed either on center frame or with isolated hydraulic unit. Operating controls/procedure automatic or manual. Electrical components U.L. approved, U.S. sockets and fuses.

| | |
|---|---|
| TOTAL POWER | 115 kW |
| POWER/Main | 55 kW |
| Power/Lights | 45 kW |
| Ground Space/Diameter | 75 ft. |

SHIPPING DATA:

Park Model

| | |
|---|---|
| Total Net Weight | 22 ton |
| Center Frame | 16 ton |
| 1 Container 20 ft. | 6 ton |

Optional

Portable model mounted on 40 foot standard type American semi-trailer with tandem axle and air brakes. Total weight of trailer loaded for shipping from factory 24 ton, plus one container approximate weight 6 ton.

**Beschreibung:**

Grosse Ausfuhrung - 6 Stufen - 48 Sitze

Auf einem Mittelbau von 10,10 m × 2,50 m ist der komplette Kettenflieger montiert. Der Mittelbau hat eine Hohe von ca 105 cm. In ihm ist die gesamte Hydraulikanlage, incl. Oel-Tank, Antriebshauptmotor und Pumpe, sowie die Elektroschalttafel installiert.

An dem Mittelbau werden 24 Stck Podiumtrager eingehakt und aussen mit den Stufenbocken verbunden. Der Gesamt-ø des Podiums mit den Stufenbocken betragt 15,70 m. Das Podium und die Stufen sind komplett mit Aluriffelblech belegt.

Auf dem Mittelbau ist der umlegbare Hauptmast auf einer verzahnten Kugeldrehverbindung montiert. Diese Kugeldrehverbindung wird von 2 Stck Hydraulikmotoren, mit zusammen 50 PS angetrieben. In dem Hauptmast sind die Schleifringe und der Hubzylinder fuer das Auf - und Abfahren des drehbaren Kopfteiles montiert. Nach dem Aufstellen des Mastes werden die 16 Stck Ausleger am Kopfteil auseinandergeklappt, untereinander verbunden und die aus Polyester gefertigten Plafond- und Fassadenteile, sowie die Lichtleisten und die 48 Stck Sitze eingehaengt. Das Komplette Kopfteil wird nun hydraulisch am Mast bis zur Grundstellung hochgefahren und abgesichert. Nun wird die teleskopartige Mastverkleidung und die 8-eckige Mittelbaukasse samt Bedienungspult montiert. Das Kopfteil wird ebenfalls mit 2 Stck 25 PS-Hydraulikmotoren angetrieben. Der maximale Flughoehenunterschied betragt ca 5,00 m.

Hochste Flughohe uber Erdboden ca 9,50 m.

Maximale Geschwindigkeit: 11U/min

Der Gesamtanschlusswert dieses Geschaftes betragt 115 KW.

**VERSANDTDATEN:**

Reise Modell

1 Mittelbau Fahrbahr

1 Packwagen 10 m

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Zierer's Wave Swingers can be seen operating throughout Europe and in North America at Cedar Point, Busch Gardens-The Old Country, Marriott's Great America-Chicago, Kings Dominion, Conklin Shows, Bells Amusement Park-Tulsa, Mariner's Landing-New Jersey, Adventureland-New York, Riverside Park-Mass., Opryland, Carowinds, Lake Winnepesaukah-Rossville, Ga., Six-Flags Great Adventure, New Jersey. In Japan - Hankyu Railroad's new Kobe City Park.

Ask the people who own, operate and maintain them. The Wave Swinger is rapidly becoming a classic among amusement rides. Its reputation speaks for itself and only one manufacturer offers it. . . **Josef Zierer.**

## Setting up:

Find center of the site on which you intend to set up the ride and move waggon until center pole is in the center of the site. Back of waggon is at the same time back of the ride.
place bolsters according to layout.Look out for superelevations.
Swing down the spindles on both ends of the waggon and swing out the two swinging arms on both sides of the waggon;fix the struts.
If the waggon has supporting cylinders level the waggon with their help and screw out the supporting spindles until they come to a stop.
For operation of supporting cylinders the small pump motor(3 kw) has to be connected;direction of rotation to either side.
The levers for the supporting cylinders are situated in the basement on the right side next to the little pump motor and are marked.

## Setting up the center pole:

Remove the two struts from the pole's end.Lift the pole by operating the hydraulic cylinder.When the pole is reaching the last third of it's way, let the lever go as soon as soon as the pole starts tilting.When the pole has reached it's final position, put bolts(M 24 * 90) head down and nuts tightening them by hand.
Disconnect and remove cylinder as well as holding device for upper eye of cylinder.Pull out holding device vor center pole and remove it.

Platform girders:

Place platform girders and step supports according to layout.
Don't forget the bolsters.Now place the platform and the steps.

Mounting the roof:

Swing out binding girders and put in frames I and fasten them.
Now put in frames II and fasten them.
Install cable bracing in top boom and stretch it.Put on frames for canvas strut them diagonally and attach cables to the two winches on the top boom.Put on twofold canvas ring and fasten it.Stretch canvas.
Remove pin from the ball bearing slewing rim.

Lifting the basket:

Remove the two bolts from the center pole and connect cables.
Make sure that the cables are not distorted.
Turn on little pump and operate main cylinder thus lifting the basket.
Make sure that no cables or tubes are damaged while lifting the basket.
Lift the basket carefully and slowly until all parts of the facade and the holding devices for the seats can be mounted.Pushing the lever to the opposite side makes the basket come down in order to mount the facade and the shackles with chains and seats.
After having mounted the above mentioned parts lift the basket until the bolts can be put into the runners.Put bolts and have the basket rest on them.
Loosen cables and remove 1. cable with lower bag.Lower 2. bag until cable can be fastend.

Tighten the 18 bolts(M 24 * 90) at the center pole hinge
with a torque wrench(70 kpm) and lock them.
Now attach the facade that hides the center pole and resembles a telescope and add the hemisphere.
Lift basket until bolts can be put a second time;this time ,however put the special bolts(with bolsters)
Lower basket and remove 2. cable.
Lower cable bags and fasten them with the original bolts at the basket.
Make sure that the bolts are sitting in their safety devices.
Fasten cupola at the upper ring.
Put main switch to "operate".
Check all bolts if they are secured.Safety pins!Split pins!
Switch off small pump motor.

Switch board:

Set up switch board.connect to power.Check fuses.

Ticket booth:

Now mount inner facade and eightfold booth.
Put in the control board and connect it with the switch board.

Control board:

Turn on switch with key.Press "ON"!Make sure that sense of rotation of main motor is correct.
In case of wrong direction switch off and change connexions.
Switch on again.

"CLIMBING" = basket climbs until it has reached final position.

"TURN" = basket turns in clock wise direction.

"OFF" = all motion stops;basket returns to basic position.

"ACUTE TURN"

= loading

EMERGENCY" = ride stops in actual position;pressing "OFF" puts ride back to basic position.

To operate ride:

"CLIMBING - TURN" = basket gets lifted until it reaches final position and turns clock wise.

When basket reaches final position pole starts turning counter clock wise

"OFF" = basket returns to basic position.

Electric system:

When switching on the motor make sure that the direction of rotation is to the right.
Check collector rings at least every 8 days for wear and lubricate with contact grease or vaseline.
Caution: When working at the basket it is very important to turn off the power!
Check the small collector rings, which are in the lower part of the pole once a year.

Hydraulic system:

Quantity of oil in tank: 1000 l.
Check oil in tank.Oil level should be 10,24 in (appr.)above bottom.
Lowest admissible level is 7,87 in above bottom of tank.
Oil to be used: Motor oil SAE 10.

Oil change:

First change after 1000 hours of operation,the following after every 2000 hours.

Filter change: First change after 500 hours of operation.
Filter to be used: 3 * Gr 440.
Check all screw joints from time to time for leakage and,if necessary, tighten them(not under pressure).Also check rotary valve at lower side of vehecle in pole base for leakage.

Greasing: Grease both ball bearing slewing rims according to manual of manufakture(KD 144).Grease all other red marked oiling points with roller bearing grease every ten hours of operation.
Don't forget the wire rope return pulleys on top of the pole.
Also grease slightly the two runners at the pole.Grease the points where the seats are hung up,the chain hooks and the frames every 50 hours of operation.
Check the individual parts for wear.

Ropes: Check the two twofold lifting ropes, which run over the return pulleys, for wire cracks.Change ropes completely after two years of operation at the latest.

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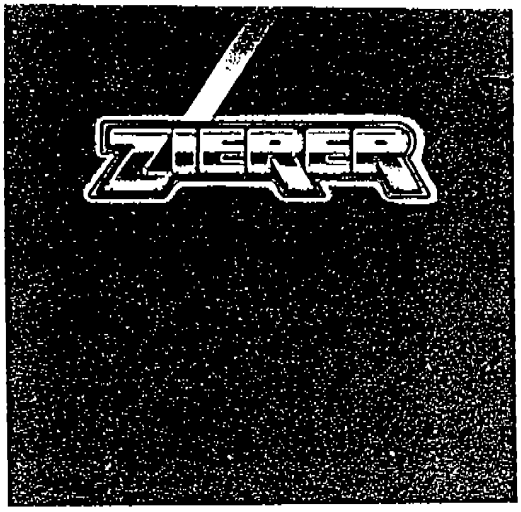


# WAVE SWINGER
# GENERAL RIDE SET UP PROCEDURE FOR PORTABLE MODEL WAVE SWINGER

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1) Location for setting up WAVE SWINGER should be relatively level and compacted or stable ground. The blocking forms supporting the ride will have the following loads during the operation of the ride.
   A) Large forms either side of mast 20 metric tons or 44,060 lbs
   B) Outrigger blocking forms either side of center mast 2.8 metr tons or 6,170 lbs.
   C) Front blocking forms under front cover of trailer 7.2 metric tons or 15,870 lbs.
   D) Middle blocking forms midway down length of trailer on each side 11 metric tons or 24,240 lbs.
   E) End blocking forms at each corner at rear of trailer 1.5 metric tons or 3,300 lbs.
2) Spot trailer on location so that center mast or tower or ride is in center of operational area. IMPORTANT!!! American configured trailer models require 17 metric/56 feet circular ground space for stepped platform with an additional 1.9 x 2.4 metres/ 6 x 8 feet for extension of center trailer past rear of platform. European configured wagon models require 15.7 metres/52 feet circular ground space for stepped platform with an additional 1 metre/3.2 feet for extension of center trailer at rear of platform.

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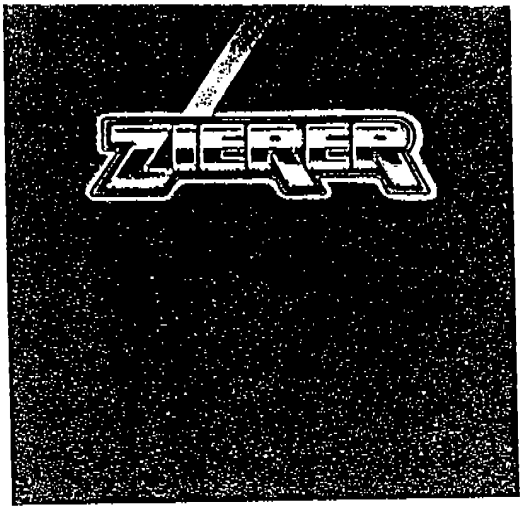


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IMPORTANT CAUTION Both American and European configured models require a clear aerial operating space of approximately 24 metres/78 feet. Please take note of light poles and buildings when spotting ride. Swing chairs will at highest point be 9.5 metres/31 feet above ground. Swing chairs at lowest point during full power operations will be 4 metres/13 feet above ground.

3) Blocking locations for center trailer.

A) Either side of center mast: This position requires the large wooden block pads 1 x 1 metre/3.2 x 3.2 feet. Position pads and metal pyramids to support trailer frame substantially on either side of center mast.

B) Outriggers: The Swing outriggers located on either side of center trailer, pin into position, place wooden pad with metal pyramid centered underneath outrigger screw jack.

C) Front corners of center trailer: Swing screw jacks down and pin into position. Place wooden pad and metal pyramid centered under screw jack each corner front of center traile

D) Middle Frame: Approximately midway from center mast to rear of trailer place wooden pad and metal pyramid on either side of center trailer frame rails to substantially support center trailer.

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E) Rear of trailer: Swing screw jacks down and pin in place. Place wooden pad and metal pyramid centered under screw jack. All screw jacks should be in their upper most position (screwed in all the way) to allow additional blocking/shimming as necessary for leveling the trailer.

4) Connect power leads and plug small pump motor into large electrical panel lying flat on trailer.
I M P O R T A N T C A U T I O N Turn on small hydraulic pump. NOTE ROTATION!!! Rotation of pump must be in correct direction. If small pump rotates correctly, large pump should also rotate in proper direction, otherwise damage will occur.

5) Leveling: Turn on small hydraulic pump, note that rotation is in proper direction. Using the levers near the small motor/pump, the leveling rams may be raised and lowered. Raise the ride and shim as needed to bring the entire center trailer into level state side to side, front to rear. A 3-4 foot plumbers level may be use Take a reading side to side on top of lower gear/bearing at bottom of center mast. Take a reading side to side at front and rear edge of trailer. Take a reading at couple of points down side edge of trailer for front to back leveling. After trailer is leveled and shimmed, tighten screw jacks firmly. Please note that it is possible to over tighten screw jacks throwing the ride out of level. Leveling rams should be raised into their upper mos positions. These are not to be used as blocking points for traile as pressure will bleed off causing an unsafe situation.

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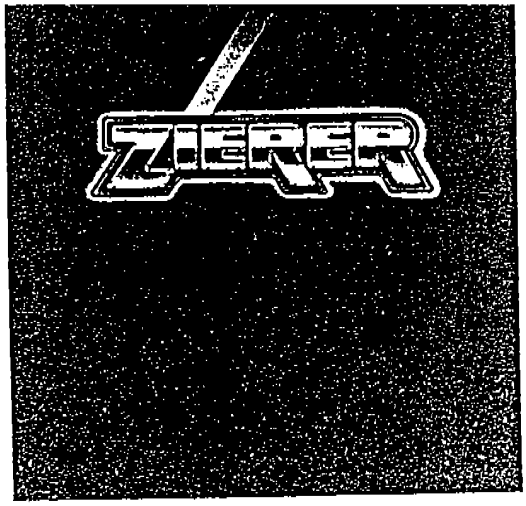


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6) The large Platform sweeps may now be pinned into place around edge of center trailer providing the upper structural supports for the circular platform. NOTE!!! Bent portions of "L" pins connecting top of sweep to edge of trailer should be pointed down. This will allow Platform pieces to lay flush against sweep and edge of trailer.

7) The Stepped Jack Stands may now be connected to end of Sweeps.

8) Slide bracing into position between ends of Stepped Jackstands at ground level. NOTE!!! Some adjustment (pushing/pulling) of Jackstands may be necessary to allow all end braces to go into place. Once all are in place the entire Platform Substructure will be square with itself and center trailer allowing Steps to set easily in place.

9) Small thin bracing iw nos placed into position at top of Stepped Jackstands further securing the Platform Substructure into place.

10) Leveling and blocking Sweeps and Stepped Jackstands: Each individual Sweep and Jackstand must be leveled and blocked into position. This is an important step, not only from a safety standpoint, but an atheistic point as well, since the upper Steps and top of Platform will be almost at eye level and any unlevel Sweep will be noted by a rise and fall of the Platform surface which detracts greatly from the overall appearance of the ride. Begin with the first Sweep or Jackstand on one side at rear of trailer. Using a 3-4 foot plumbers level, take a reading along the top of the Sweep and along the bottom of Jackstand. Block and shim with wood until all Sweeps and Jackstands are perfectly

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10) Continued:

level. IMPORTANT!!! Rocks or stone should not be used for level as these will crumble or give away due to the walking of patrons up and down the Platform.

11) Beginning at outer edge of Platform, place Decking and Steps into position building up until top of Platform is reached. NOTE!!! It is only possible to build one level at a time completely around the Platform before the next level or step is put into position as each level or Step locks/hold the previous component in place

12) Upper Decking: Starting against edge of trailer, place corresponding numbered Deck piece against trailer edge. Numbers on Deck pieces match number on Sweep. After placement of all numbered pieces, begin placing next Deck piece working toward the outer edge of Platform until reaching Steps. Stepped Platform is now completed.

13) The Basket Sweeps are now unfolded and pinned into position. Pin all Middle Cross Bracing that go between Sweeps thus connecting Sweep to Sweep. Insert and pin into position all Outer Cross Braces that make up outer edge of Basket.
NOTE!!! Small flat pins on outer Cross Braces go in bottom position and face out from center of ride. Canvas Top attaches to these pins. It is not possible to complete entire Basket, 3-4 sweeps directly under Mast which is laid over they must remain detached to fascilitate removable of Mast Erection Cylinder.

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14) Pin Fiberglass Umbrella top (with Fancy Crown if so equipped) into temporary Mounting Bracket at end of Center Mast.

15) Connect wire rope Set Up Cables to Lift Cable Shackles and lay into Guide Runway down length of Center Mast.

16) Activate Mast Erection Cylinder via hand lever located under center trailer causing Center Mast to be raised. Go slowly making certain all hydraulic lines are clear and not being pinched or pulled as Mast rises.

17) As Mast nears vertical position make certain all foreign matter (hands and fingers included) are clear of Mast Mating Surfaces. Push Mast into total up right vertical position.

18) Place large bolts with heads toward ground up through holes around Center Mast Mating/Coupling Surface Flange.

19) There are not set torque specification for these bolts. Tighten firmly also double nut and tighten firmly. Use wrench with a handle that is at least 18" long.

20) Disconnect pin attaching Erection Cylinder to Center Mast and retract ram into Cylinder to it's fullest position. This goes slwoly do not expect it to move quickly.

21) Disconnect pin that attaches Erection Cylinder to center trailer. Disconnect all hydraulic lines to Erection Cylinder and seal of lines with appropriate plastic cap.

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22) Using 4-5 men, lift Erection Cylinder out of position and store. NOTE!!! It is permissable to walk on edges or large electrical control box but care must be taken not to step in center as damage to components will occur. Erection Cylinder is heavy and caution/safety should be given this procedure.

23) Basket Sweeps may be completely connected at this time.

24) I M P O R T A N T!!! A mechanic should stand on top of Basket and determine if the number 1 Basket Sweep is running from the Center Basket toward edge or ride at a true 90° angle. If not, the Basket must be held in place by running an 8 x 8 timber through the access porthole in the Basket Structure and wedging it against Guide Track Runway on the Center Mast thus locking the Basket in place and all Sweeps may be pushed/pulled until the number 1 Sweep is running perfectly 90° perpendicular to the Basket. If this is not done, the fiberglass decorations/facade will not fit easily into their corresponding mounting slots.

25) Connect all wire ropes Cross Braces with turnbuckles to appropria locations on Basket Substructure in correct criss cross pattern and tighten firmly by hand. This totally stabilizes and secures the Basket Substructure and holds it square.

26) Place the triangle shaped, cable operated, Center Canvas Support members into the appropriate slots on top of the Basket Sweeps and pin into place.

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27) Place and pin the Cross Brace members between Center Canvas Suppor Structure. NOTE!!! Each piece is numbered and will only fit properly in one location.

28) Connect Canvas Tensioning Cables to hand cranks.

29) Attach curved pipes to top of Center Canvas Support Structure and pin in place. This completes the Ring the top canvas attaches to around the Center Mast.

30) On fold Canvas Top attach hooks to Center Ring at top unfold and connect bottom of Canvas to Outer Basket Cross Members. Attachmen point is flat head pins located on bottom of outer Cross Members connecting Basket Sweep to Basket Sweep.

31) Buckle and snap upper center portion of Canvas Top together that is hooked onto Center Ring.

32) Lace Canvas together and raise Center Canvas Support Structure via Hand Cranks until Canvas is tight. Count the number of teeth on each of the two Hand Cranks thus assuring Ring and Canvas are equal on both sides.

33) Safety pin Center Canvas Support Structure Sliding Mechanism with "L" pin.

34) Connect Basket Lift Cables to Basket by inserting pin through Lift Cable Shackle and Basket Attachment Tab. Access is gained by reaching through porthole in Basket Structure and then inserting pin. It is beneficial if one mechanic stands on top of Basket and pulls Cable and Shackle up or down and other mechanic inserts pin after centering Shackle over Tab.

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## WIRE ROPE LIFT CABLES:

Annually very closely inspect the Lift Cables for any signs of deterioration, cracking or breaking of cable strands. Also closely inspect where the cable goes into Shackles looking for any signs of the Cable pulling out of the Shackle. Closely inspect Cable Eyes that attach Cable to Lift Cylinder looking for abnormal stress on Eye and where Cable is joined together forming Eye.

Cables may be used for approximately three (3) seasons but should be inspected closely during 3rd season and completely changed after 3rd season.

## SWING CHAIR CHAINS:

A 5 millimeter butt welded chain is used on the WAVE SWINGER. Tested strength of the Chain is 55.11 lbs. per square millimeter, which equal 1,082 lbs. Deformation of the Chain will begin at 97 lbs. per square millimeter, which equals 1,904 lbs.

Life of Chain depends upon environment mostly used in but normally 3-4 years, depending on wear. Chain life may be extended by turning chains upside down after 2 season's use. The greatest amount of wear occurs at the first 3-4 feet up from the Chairs. By removing and placing this portion of the chain up at the Spreader Bar (turning entire chain upside down) chain life is extended.

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## MAST BOLTS:

The Bolts used to connect the mating surfaces of the Center Mast when it is raised into position are 24 mm x 90 mm long, European grade 8.8. While torquing of these bolts to a certain foot pound is not required, it is suggested that a wrench with a minimum 18 inch handle be used and all bolts be tightened firmly and double nutted. This should yield a value of approximately 40-45 foot pounds. Mast Bolts may be replaced annually as a precautionary measure.

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Spezialbetrieb für das
Schau- und Belustigungsgewerbe
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ZIERER

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ANNUAL INSPECTION OF CRITICAL POINTS ON WAVE SWINGER

| Ihre Nachricht | Ihre Zeichen | Unsere Zeichen | Tag |
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YEARLY INSPECTION MAY BE PERFORMED VISUALLY OR BY MAGNA-FLUX.

1. PINS ATTACHING SUPPORTING STRUTS TO BASKET CENTER.
2. TWO (2) PULLEYS AT TOP OF TOWER.
3. THE FIRST 2 FEET OF CHAIN FROM THE CHAIR.
4. THE FIRST 2 FEET OF CHAIN FROM THE SPREADER BAR.
5. S-HOOKS ATTACHING THE SPREADER BAR SHACKLES TO THE SUPPORT STRUT SHACKLES.
6. BOLTS AND SHACKLES ATTACHING THE S-HOOKS TO THE SUPPORT STRUTS AND SPREADER BARS.

VISUALLY INSPECT ONLY.

7. NYLON BUSHINGS IN SPREADER BARS.

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# WAVE SWINGER
# GENERAL RIDE SET UP PROCEDURE FOR PORTABLE MODEL WAVE SWINGER



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35) Activate Main Lift Cylinder hand lever located under Center Trailer causing Basket to be raised. Lift Basket 3-4 feet only and stop.

36) Place all Fiberglass Decorative Panel Hanger Pieces into appropriate connection/attachment points and pin in place. NOTE!!! The inner most Hanger Pieces are slightly different from each other. There are four that have bolt holes welded to them. These are for mounting the large Fiberglass Ball/Dome Structure that goes between Basket Panels and Mast Panels. They must be placed equal distance from each other so that the Dome Bolts will line up with them upon it's installation.

37) Attach S-Hook Chain Hangers to appropriate tabs at bottom of Basket. Opened end portion S-Hook goes toward center or ride. Bolts attaching S-Hooks to tabs are placed through the holes in the direction the ride rotates (CLOCKWISE) if you are standir on the edge of the Platform looking toward the center of the ri the bolt head will be on the right, the nut on the left.

38) Place a small amount of grease between the S-Hooks and the Upper and Lower Clevis.

39) The Large Fiberglass Scenery Panels may now be placed into position, sliding the outer edge into position first then raising the inner edge and locking into place.

40) The Small Vertical Decorative Panels are dropped into position at inner edge of Large Panels.

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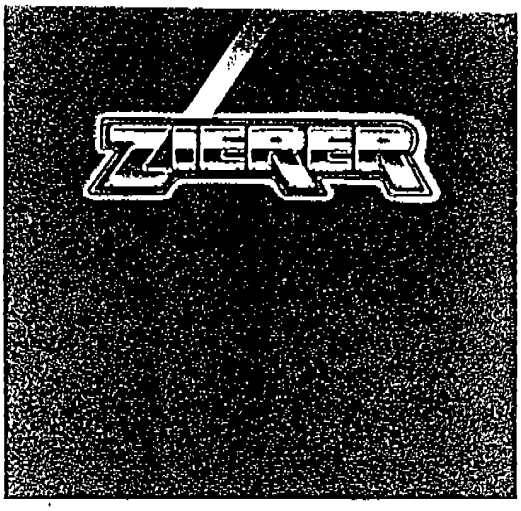


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41) The Medium size Fiberglass Panels are placed into position in similar fashion as Large Panels and locked into position, completing the under side of the Basket.

42) The Long Light Strips are now placed in between Decorative Panels on bottom of Basket. One mechanic should be inside Basket Structure itself telling other workers when tabs are lined up and to push Light Strip in place. Also he will pull all electrica cords and plugs through to interior of Basket.
NOTE!!! These Light Strips are numbered and are to be mounted on to corresponding numbered Sweep. The electrical cords are cut to proper length so that connection to electrical board mounted on Basket Sweep is facilitated.

43) Light Strips are mounted on to the Large Vertical Fiberglass Decorative Panels via washers and wing nuts. These Large Panels make up the outer edge of the Basket Facade. With the Panel place flat on the ground, bottom at your feet, the Light Strip runs alon the bottom of this Panel with the electrical cord and plug being on the left hand side. There is a notch in the Panel that allows the cord to pass into interior of the Basket.

44) Place the large vertical Fiberglass Panels on members at end of each Sweep.

45) Place the Curved Lighting Strip in between Vertical Fiberglass Decorative Panels mounting them on vertical steel members at each end of Sweep. Electrical cords and plugs must be passed to interior of Basket while Light Strip is slid into place. One cord on each side of metal structural member. Flap on Canvas

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45) Continued
Top may now be locked into place and safety pinned.

46) Basket may now be raised slightly allowing easy access to bottom of S-Hooks for attachment of Chain Spreader Bar and Chairs. Activate hand lever raising Basket.

47) Bring all Chairs on to Platform grouping them by colors. All reds together, blues, yellows, etc. Stamped onto the Spreader Bars is either an "A" for outside, "I" for inside. The "I" Chairs should be placed in the inner most position. All "A" Chairs go to the outside or middle.

48) Attach all Spreader Bars to S-Hooks with the stamped letter facing the direction the ride rotates (CLOCKWISE) and all bolts also being inserted in the direction the ride rotates as was done when mounting the S-Hooks to the Sweep Tabs. ~~See Step #39~~.

49) Mount Curved Fiberglass Dome Shaped Decorative Panels to under side of Basket Scenery Panel Hanger Members. Bolt together and tighten firmly. No torque specifications required. Double nut for safety.

50) Attach long Box Metal Hanger to bottom of Basket.

51.) The Basket should now be very close to the first set of large Pin holes located in the Basket Roller Guide Track. Raise the Basket slightly past this point and insert the large metal Pins that block the Basket from traveling back down the Mast. The Large Pins are normally found in their special storage slots located on the Center Mast. Activate hand lever lowering

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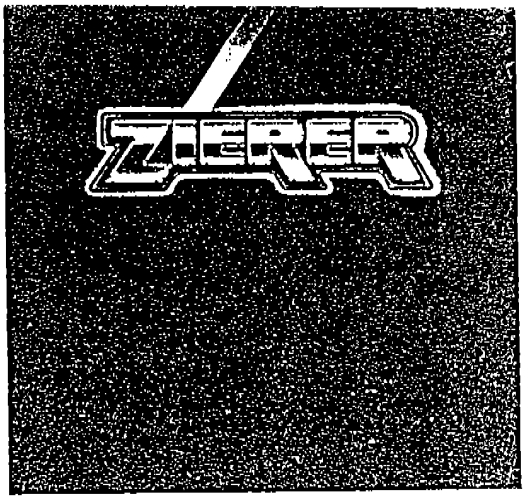


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51) Continued

Basket until it rests on these pins. Keep the lever pulled allowing as much slack as possible on the Lifting Cables. Remove one set of the Set Up Cables and reconnect remaining Cables to Basket in preparation for further lifting or the Basket.

52) Bring onto the Platform the Four Metal Structures that make up the Tower Panel Substructure. Bolt together creating two halves. All tabs and slots are to be facing upward. There is a special pin and drilled tab which when assembled correctly will face directly across from each other and are found on the top side Tower Panel Substructure. Place the Rolling Bar onto this pin and secure via "L" pin through drilled tab at opposite end. This Rolling Bar allows the numerous hydraulic hoses to move freely over the Tower Panel Substructure causing no wear to the hoses.

53) Place the two Tower Panel Substructure components around the Center Mast and pin together. Lift the Substructure and attach to Boxed Hanger Members.

54) Mount small fiberglass Tower Scenery Panels to Substructure.

55) Mount Light Strips in between small fiberglass Tower Scenery Panels with angled end and electrical cord positioned at top of Panels.

56) Activate hand lever raising Basket further up Center Mast.

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57) Hang large Tower Scenery Panels from bottom of Tower Panel Substructure and pin together.

58) Mount Light Strips in between large Tower Scenery Panels with electrical cords and plugs positioned at top of Panel.

59) Activate hand lever raising Basket past second/final set of holes for Basket Stop Pins. Remove Pins from lower holes and move to upper set of holes. Rubber Basket Stop Bumpers should also be brought to this level.

60) Position the Basket Stop Bumper inside the Basket Roller Guide Track. The rubber portion should face down providing a long metal side sticking up toward the Basket. Insert Pin and lock in place.

61) Activate hand lever lowering Basket down onto Basket Stop. Continue to activate handle allowing as much slack as possible in the Lift Cable.

62) Remove last Lift Cable Extensions and store making sure all Pins are accounted for.

63) With one mechanic standing on top of Basket, guide the Lift Cable Shackle over the Basket Attachment Tab. Again access is gained by reaching through porthole in Basket. The Basket may have to be rotated and this is easily accomplished by pulling on the Swing Chairs attached to outer edge of Basket. Reach through the porthole and help guide the Shackle over the Attachment Tab. When both are perfectly lined up, insert the Special Threaded Pins into the Shackel using the T-Handles provided. Once the Pin is completely seated, slide the Locking Tab located on

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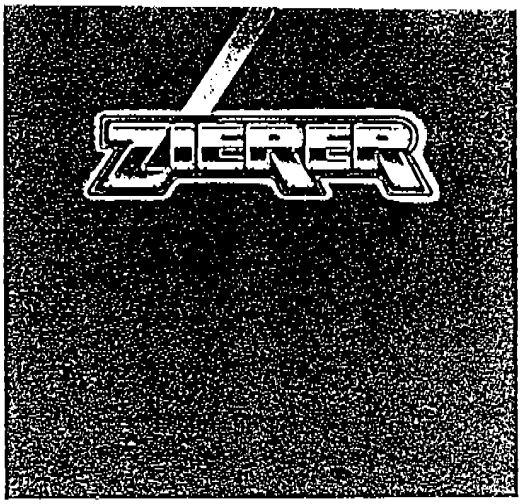


# WAVE SWINGER
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63) Continued

the Shackle into the groove in the Pin and unscrew and remove the T-Handle. Repeat same procedure other side.

64) Activate the hand lever raising the Basket high enough to clear Basket Stops. Remove the pins holding the stops and now place the rubber portion of the Stop up toward the Basket and the long metal portion will not be facing the ground. Insert the pins and lock in place. This is correct position for continued operation of the ride and provides a cushion or damper when the Basket comes to rest on it.

65) Activate hand lever raising Basket until Canvas Mounting Ring is positioned apporximately 6 inches from Fiberglass Umbrella/ Crown. Remove pin from Temporary Mounting Bracket and attach Crown to tabs on Canvas Support Ring using the Spacer Bars with notched ends fitting around Ring. Bolt together. NOTE!!! This is not a tight exact fit, some movement is allowed for. Temporary Mounting Bracket may be removed to allow extra clearance between Crown and Top of Center Mast. If Crown is equipped with light package option be certain to zie tie electrical cords securely out of the way of Center Mast Top, otherwise, it is possible for them to become intangled with Mast and be pulled apart. Connect electrical cords to power outlet provided on electrical board mounted between Basket Sweeps.

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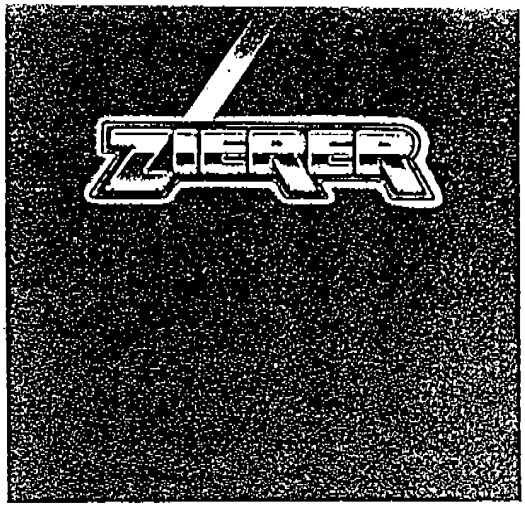


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66) Acitvate hand lever raising Basket to the very top of Center Mast. Basket will be angled over at this time.

67) Mount 4 Tower Panel Stop Brackets onto Center Mast. Secure with bolts and tighten firmly.

68) Turn the large ball cock hand lever located at base of large electrical Control Box. This allows fluid from large hydraulic pump to flow through Valve Block Manifold providing power for operation of the ride. NOTE!!! Small hydraulic pump will not be inoperative.

69) Turn the 2 small ball cock hand levers located near small hydraul pump/motor disengaging or blocking flow of hydraulic fluid from this pump also activating flow of hydraulic fluid for Foot Brake system. I M P O R T A N T!!! If these three ball cocks are not turned, ride will not operate.

70) Clear all hydraulic cables and electrical cords and raise large electrical control panel into position.

71) Bring all Control Booth Panels onto Platform and join together following numbered sequence at bottom inside of each Panel. Secure all Panels together with long thin nails provided.

72) Mount Decorative Panel Support Members at each corner on top of Control Booth Panels via wing nuts.

73) Mount decorative fiberglass Scenery Panels that angle back toward Tower Panels from top of Control Booth Panels. NOTE!!! Some adjustment of entire Control Booth may be necessary to make certa that there is sufficient clearance between Angled Scenery Panels and Tower Light Strips so that no light bulbs will be broken

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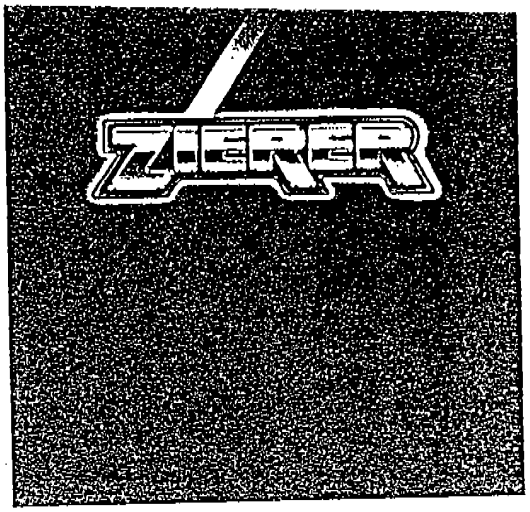


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73) Continued
during operation of the ride. Secure all Angled Scenery Panels with bolts and wing nuts.

74) Mount Light Strips in between Angles Scenery Panels.

75) Mount Operator's Shelf inside Control Booth.

76) Remove lower bearing/gear Holding Bracket and store.

77) Mount Operator's Control Panel and connect electrical cord to proper coupling on large electrical control cabinet at rear of Control Booth.

78) Build up/connect Wooden Lower Gear/Bearing Cover and Wooden Center Mast Cover.

79) Starting at very top interior of Basket connect all electrical and power cords also double check athat all Cross Cable Turn-Buckles are tight and secure.

80) Double check that no safety pins, L-pins, washers, bolts or any other foreign objects are inside Basket Center that may become lodged in Upper Basket Gear/Bearing.

81) Visually check that no loose objects are remaining inside of Basket Fiberglass Panels, etc. Otherwise it is very noisy when the ride begins to rotate.

82) Connect all light cords accordingly for all Light Strips inside Tower Panels.

83) Mount flourescent Light Boxes at top of each Control Booth Panel on inside.

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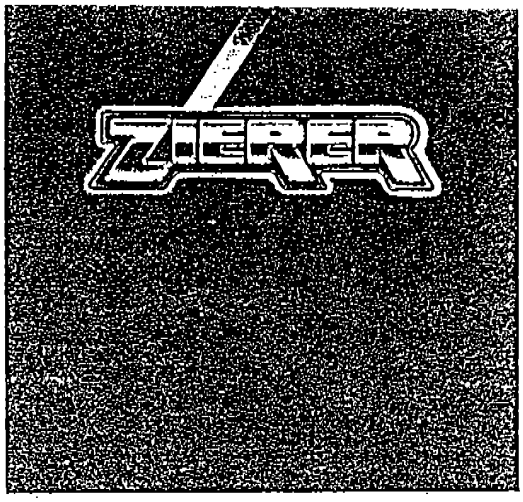


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84) Connect all electrical cords accordingly providing power for all Control Booth Lights and Light Strips.

85) Mount Inside Fence Posts and Rails.

86) Starting with section that goes across rear of Platform, mount Outside Fence continuing down the Steps, around the perimeter of Platform and up other side of Steps completing Outside Fence.

87) Attach Entrance and Exit Ramps to edge of Platform.

Visually check that all "L" pins, bolts, etc. are safety pinned accordinly.

Visually check that entire Platform and Steps are free and clear of all tools and debris.

WAVE SWINGER is now fully erected and ready for TEST OPERATION.

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WAVE SWINGER

OPERATING PROCEDURE

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Initial Testing After Set Up and Ride Operating Procedures:

1) Turn on Main Switch located on large electrical panel at rear of Operator's Control Booth.
2) Check 3 phases via meter located on large Electrical Panel.
3) Turn on Light Switch located on large electrical panel at rear of Operator's Control Booth.
4) Emergency Switch located on Operator's Control Panel must be in "OFF" position.
5) Turn on Key Switch.
6) Position 2 mechanics to watch rotation of large Hydraulic Pump and Motor.
7) Press "Pump On" button I M P O R T A N T!!! Note rotation of Pump and Motor. Change electrical leads if not correct.
8) Note "Oil Control" light. If oil level is not sufficient, Pump will not switch on.
9) Press light button "Red" then "White". Corresponding light strips should be illuminated when activated. Correct light connections as necessary to illuminate proper colors. NOTE!!! When one color is turned on other color will automatically turn off.
10) Manually set Timer providing number of seconds for actual ride duration.
11) Depress and hold "Tipp" button causing slow rotation of Basket. Visually check that all Lap Bars are down and in proper position.
12) Depress "Climb" button then "Turn" button. This instigates the beginning of the automatic ride sequence. The Upper Basket will begin to rise and then by tripping Limit Switches the other functions are brought into play. The Basket rises then begins to rotate, once the Basket reaches a certain point on the Mast, the Tower/Mast begins to rotate in opposite direction

continued....

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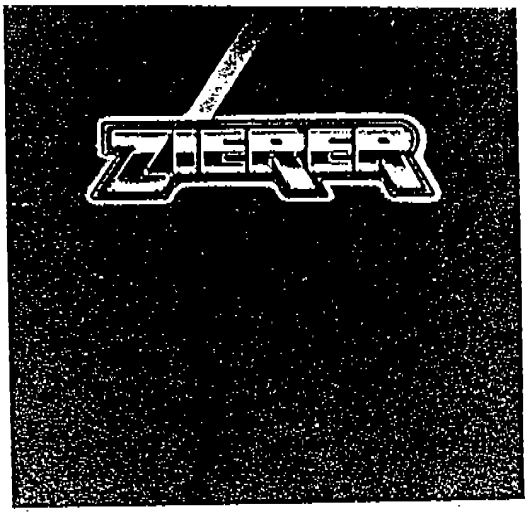


WAVE SWINGER
OPERATING PROCEDURE



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from the Basket. When the Basket attains its fullest ascent up the Mast and is tilted over and due to the Basket rotating clockwise and the Tower/Mast rotating counter clockwise, the oscillating or wave effect is produced.

13) When the "Timer" runs to zero, the ride automatically shuts off allowing the Basket to descend the Mast into the unloading/loading position. As the Basket comes down the Mast, the Limit Switches are again tripped shutting off the Tower rotation, Basket rotation, and at its lowest point flow of Hydraulic Fluid completely.

14) When the Basket Rotation is disengaged, the Operator may at that time gently depress the Foot Brake easing the ride to a complete stop. NOTE!!! Quick hard application of the Foot Brake may cause chairs to bump together causing minor injuries to riders.

IMPORTANT!!! Check function of Hydraulic Oil Coolers' Radiators; they must switch on automatically when the fluid temperature reaches 35 degress Celsius or approximate 98 degress Farenheit.

The WAVE SWINGER is now ready for public operation. The following is an outline of procedures routinely followed when all functions have been preselected and the attraction is being operated in the automatic mode.

1) Emergency Stop button - OFF
2) Key Switch - ON
3) Hydraulic Pump - ON
4) Depress - Climb then Turn
5) When ride completes sequence and Basket has returned to the load/unload position - Gently apply Foot Brake
6) Repeat steps 4-5 for continuous repeat operation

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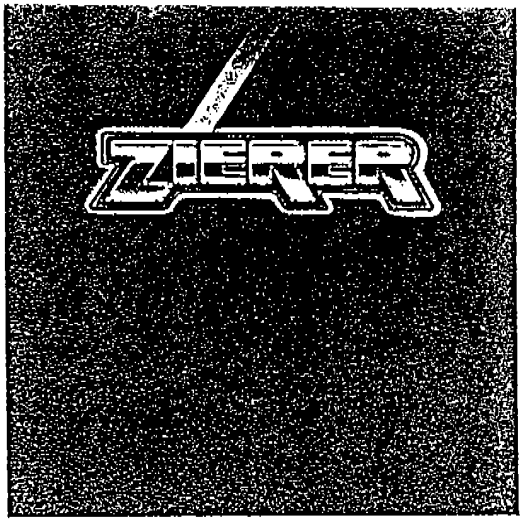


# WAVE SWINGER
# MAINTENANCE INSTRUCTIONS

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I M P O R T A N T ! ! !  C A U T I O N ! ! !  D A N G E R !

All electrical power must be switched OFF, otherwise electrocution is possible.

## DAILY MAINTENANCE:

1) Beginning with the Crown, make sure all nuts and bolts attaching Crown to Canvas Support Ring are tight. Also make sure electrica cords from Fancy Crown are secure and clear of Mast Top.

2) Grease with top quality bearing/axle grease the Lift Cable Pulley located at the Mast Top. Do not forget to grease fitting located inside Mast.

3) Visually check that all L-Pins and Safety Pins are in place and properly secured.

4) Visually check that no foreign objects have fallen inside Basket Center and in danger of becoming lodged in Gear/Bearing teeth.

5) Visually check for any oil seepage from Hydraulic Basket Drive Motors or hoses.

6) Visually check all electrical connections of light strips.

7) Check tension of wire rope Cross Brace Cables, tighten turn buckles as required.

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# WAVE SWINGER
# MAINTENANCE INSTRUCTIONS



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8) Check tension of Canvas Top, turn hand cranks as required.

9) Check electrical Brushes and Collector Rings inside Basket Center. NOTE!!! Should you hear a howl or screech while ride is operating, it may be the Collector Rings. Grease with vaseline.

10) Grease Ring and Pinion Gear located inside Basket according to Instruction Sheet KD 114-1 enclosed.

11) GreaseUpper Basket Bearing according to Instruction Sheet KD 114-1 enclosed. Grease nipples are normally found on underneath portion of bearing.

12) Grease the 4 Outer Basket Guide Rollers.

13) Grease the 4 Inner Basket Guide Rollers.

14) Using spray type non running grease, grease the Guide Track surfaces as required. NOTE!!! Grease only when needed and wipe away as much excess grease as possible. Over greasing will cause messy droppings inside Control Booth. Grease only portion of Guide Track that Basket Guide Rollers move on during normal operation.

15) Visually inspect Lift Cables looking for broken strands or deterioration of cables.

16) Visually inspect Lift Cable Shackles and attachment Pins.

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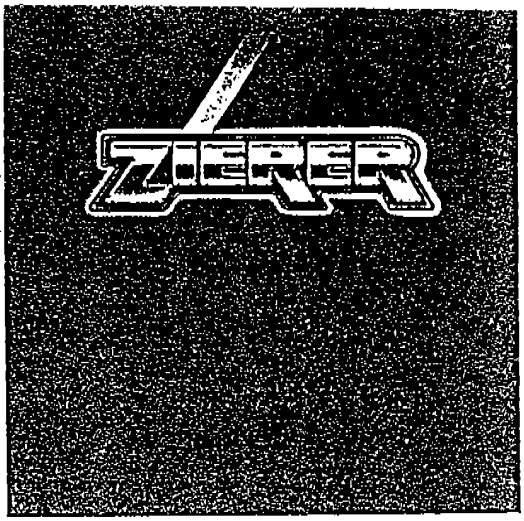


# WAVE SWINGER
# MAINTENANCE INSTRUCTIONS



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17) Check tightness of bolts securing Dome Shaped Fiberglass Panels to Basket Sweeps.

18) Visually inspect Rubber Basket Stop Bumpers for deterioration o Rubber Bumpers.

19) Visually check all Hydraulic Hoses running from Basket to bottor of Center Mast.

20) Visually check all electrical cord connections for Light Strips located on Tower Panels.

21) Visually check Sliding Portion of fiberglass Tower Panels, lubricate with silicone as required.

22) Visually check Nylon Rubbing Blocks that slide in Mast Guide Tr

23) Check tightness Tower Panels Stop Brackets that lower Tower Pan rest on when Basket is in load/unload position.

24) Remove Wooden Tower and Gear/Bearing covering.

25) Grease Tower Ring and Pinion Gear according to Instruction Shee KD 114-1.

26) Grease Tower Bearing according to Instruction Sheet KD 114-1. Grease Nipples located on side of Bearing just underneath Ring Gear Teeth.

27) Visually inspect interior of Control Booth all lighting connect etc. Keep area free and clear of all trash and debris.

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# MAINTENANCE INSTRUCTIONS



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28) Make certain no tools or other items remain in Upper Basket. Besides being dangerous, it is very noisy when they roll around on the fiberglass scenery panels.

29) Replace wooden Tower and Gear/Bearing covering.

30) Check Oil Level in Hydraulic Tank. Normal level is 10-1/4 inches from bottom of Tank, minimum allowable is 8 inches from bottom of tank.

31) Check Blocking of Center Trailer and Platform Jackstands. Shim as needed.

32) Visually check condition of platform and steps in general.

33) Check that all fencing is secure.

34) Visually check condition of all fiberglass scenery panels and light strips.

35) Visually check that all Safety Pins are in place on all S-Hooks.

36) Visually inspect all Spreader Bars, Chains, Chairs, Lap Bars and Plastic Chair Inserts.

37) Test Run ride listening for any abnormal sounds that may indicate problems.

38) Test Run ride and visually check blocking this time looking for abnormal or excessive movement.

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WAVE SWINGER
MAINTENANCE INSTRUCTIONS



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39) Test Run ride this time with mechanic positioned far enough away to clearly visually check Canvas Top and Fancy Crown if so equipped looking for abnormal movement in Crown also looking to make certain Canvas Top is buckled, snapped, laced and secure properly. Also note any abnormal movement in light strips and Scenery Panels around edge of Basket.

40) Switch on all lights and visually check for burned out bulbs, replace as necessary.

WAVE SWINGER is now ready to open to the public.

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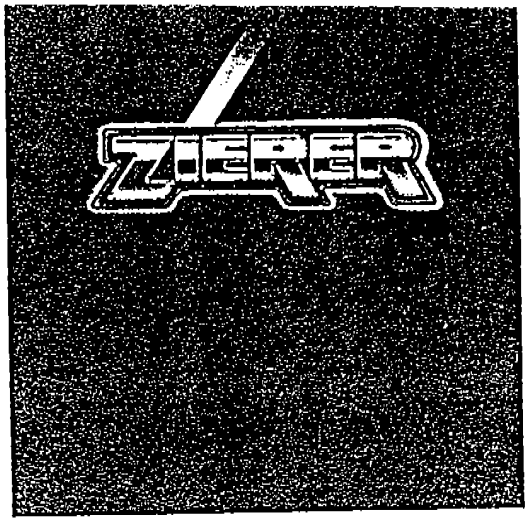


# WAVE SWINGER
# MAINTENANCE INSTRUCTIONS



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## WEEKLY MAINTENANCE:

1) Once a week or during ride set-up, lightly grease between S-Hooks and Shackles that attach S-Hooks to Basket Sweep and S-Hooks to Spreader Bar. Wipe away any excess grease build-up as this will drop onto riders creating an unhappy customer.

2) Once a week or during ride set-up, closely inspect condition of Chair Chains. Inspect the first 3-4 feet of each chain starting at the point where it attaches to Chair and moving up toward the Spreader Bar. This section receives the most movement thus the most wear.

## ANNUAL MAINTENANCE AND SPECIAL INSTRUCTIONS:

## HYDRAULIC SYSTEM:

The WAVE SWINGER will operate on any top quality Hydraulic Oil of approximate SAE 10 weight. 1,000 litres or 265 gallons of oil are required. Change Oil Filters annually. Total of six filters are required located in Hydraulic Oil Tank. Change Hydraulic Fluid annually.

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WAVE SWINGER

EMERGENCY PROCEDURES

Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date:

There are two types of emergency situations encountered while operating amusement rides

1) The first type requires that the ride sequence be shortened or ended immediately. but the ride may be allowed to come to a stop in the normal routine manner. Merely press the OFF button on the control board and the WAVE SWINGER will cycle down into the load/unload position. Apply the foot brake as required to bring the ride to a safe and gentle stop. This emergency situation usually occurs when a rider becomes ill or wants off the ride badly and appears to be on the verge of panic.

2) The second type requires that the ride be brought to a hault absolutely as soon as possible. There is a situation that exists that may cause injury to either riders and/or by-standers.

   A) Hit the Emergency Stop button. The WAVE SWINGER Basket will continue to free rotate but is not under power.

   B) After the Basket has slowed to a reasonable rate, gently apply the foot brake, easing the Basket to a stop.

   C) Reassure all riders, ask them to remain calm and to NOT TO ATTEMPT LEAVING THEIR CHAIRS.

   D) Remove or correct item or situation that has caused the emergency situation if possible. Ex: A child has entered the ride operating area and is looking up at the people on the ride while the ride is in full motion. Remove the child to the proper safety area.

   E) Release the Emergency Stop button.

   F) Press the OFF button and hold it down. The ride will stop descending whenever the OFF button is released. Hold the button down until the Basket returns to the load/unload position.

   G) Evacuate riders and complete correction of situation if required.

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ZIERER

Karussell- und Fahrzeugbau

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ANNUAL INSPECTION OF CRITICAL POINTS ON WAVE SWINGER

| Ihre Nachricht | Ihre Zeichen | Unsere Zeichen | Tag |
|---|---|---|---|

YEARLY INSPECTION MAY BE PERFORMED VISUALLY OR BY MAGNA-FLUX.

1. PINS ATTACHING SUPPORTING STRUTS TO BASKET CENTER.
2. TWO (2) PULLEYS AT TOP OF TOWER.
3. THE FIRST 2 FEET OF CHAIN FROM THE CHAIR.
4. THE FIRST 2 FEET OF CHAIN FROM THE SPREADER BAR.
5. S-HOOKS ATTACHING THE SPREADER BAR SHACKLES TO THE SUPPORT STRUT SHACKLES.
6. BOLTS AND SHACKLES ATTACHING THE S-HOOKS TO THE SUPPORT STRUTS AND SPREADER BARS.

VISUALLY INSPECT ONLY.

7. NYLON BUSHINGS IN SPREADER BARS.

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# WAVE SWINGER
# GENERAL DESCRIPTION OF RIDE SEQUENCE

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Operator manually sets timer to desired number of seconds for ride cycle. Depress and hold down the "TIPP" button causing the upper basket to slowly rotate allowing operator to look at all passengers making certain that all lap bars are in place and that all through-the-leg restraints are fastened. Release "TIPP" button and depress first "CLIMB" then "TURN". This instigates the beginning of the Automatic Ride Sequence. The upper basket will geing to climb and then by it tripping limit switches, the other functions are brought into play. The basket rises then begins to rotate and once the basket has climbed to a certain point up the mast, the mast itself begins to rotate in the opposite direction from the basket. When the basket attains its fullest ascent into the curved or bent section of the mast this creates the wave or oscillating effect which is the trademark of the ride. When the timer runs to zero seconds, the ride automatically shuts off allowing the basket to descend the mast into the unloading/loading position. As the basket descends the mast the limit switches are again tripped, shutting off the tower rotation and at its lowest position the basket rotation, at which time the operator may apply the foot brake to halt the free spinning of the basket. When the ride is completely stopped the riders may safely leave their seats and a new ride cycle is ready to begin. The operator has only manual control of the lights which he causes to alternate by depressing the "RED" or "WHITE" buttons on the control panel. Please note it is only possible to illuminate half of the lamps at one time. The contactors in the electrical panel will automatically disengage one set of lights when the other set is desired to be illuminated.

Total manual operation of the ride is possible, but for safety reasons and to allow consistent high hourly capacity, it is not recommended.

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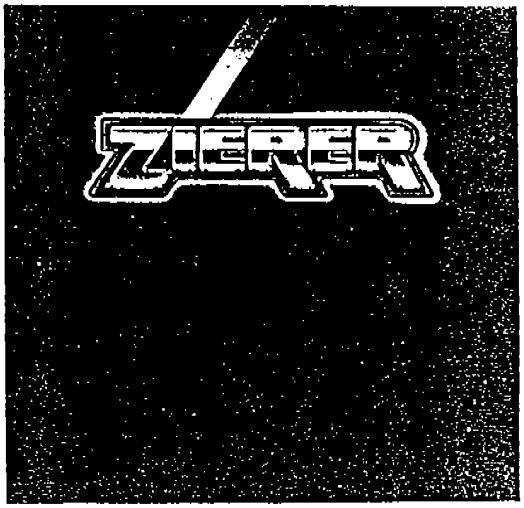


# WAVE SWINGER
# RIDE OPERATIONS CONTROL SYSTEM DESCRIPTION

| Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date: |
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The operator's control panel consists of a key switch for main power on, manual button with indicator lamp for main hydraulic pump on, timer which is set manually for the ride cycle, emergency "OFF" switch allowing immediate halting of the ride sequence, hydraulic oil lever indicator lamp, manual button for turning on white lights, manual button for turning on red lights, manual button for all lights off, manual button "TIPP" for slow rotation of upper basket when in unload/load position, manual button "OFF" for manual stopping of ride sequence, manual button "TOWER" for rotation of tower causing the oscillating or wave effect, manual button "TURN" for rotation of upper basket from which are suspended the swing seats, and manual button "CLIMB" for beginning the ascent of the upper basket up the tower to full height.

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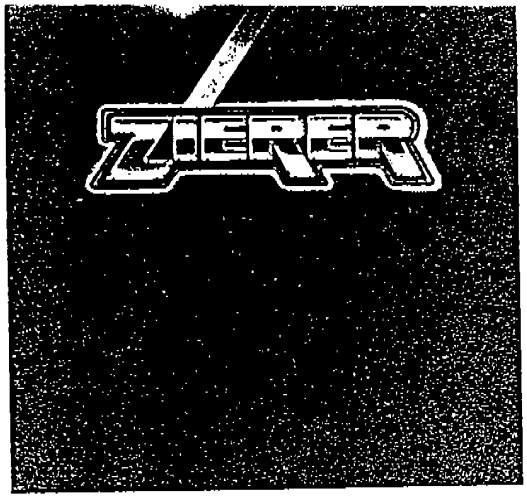


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# WAVE SWINGER
# GENERAL INFORMATION AND MINOR TROUBLE SHOOTING

| Ihre Nachricht: Your message dated: | Ihre Zeichen: Your reference: | Unsere Zeichen: Our reference: | Tag: Date: |
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## MAST LIMIT SWITCHES:

There are five (5) Limit Switches located on the Center Mast of the WAVE SWINGER. As the Basket moves up and down, the Limit Switches are tripped causing the following functions to occur. The Switches are being numbered for reference with Switch 1 being the lowest on the Mast, Switch 5 the upper most Switch located at top of Mast.

## A S T H E B A S K E T C L I M B S

Switch 1) This Limit Switch causes the flow of hydraulic fluid to stop when Basket comes down into loading/unloading position. Switch 1 is merely set as Basket travels up Mast during ride sequence.

Switch 2) As the Basket climbs past, Switch 2 it is tripped causing Tower Rotation to begin.

Switch 3) As the Basket moves past, Switch 3 is set; it will stop rotation of Basket when it is tripped on Basket's descent into loading/unloading position.

Switch 4) As the Basket climbs past, Switch 4 is set; it will cause Tower to stop rotating when tripped by Basket on its descent.

Switch 5) When tripped by Basket as it moves past, Switch 5 stops the climb/lift of the Basket.

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AS THE BASKET LOWERS

Switch 5) Is reset for next ride cycle, will cause climbing of Basket to cease.

Switch 4) As the Basket lowers, Switch 4 causes Tower rotation to stop.

Switch 3) As the Basket lowers, Switch 3 causes Basket rotation power to stop. Basket will continue to free rotate because of kinetic energy.

Switch 2) Is reset for next ride cycle, will cause Tower to start rotation.

Switch 1) As the Basket lowers, Switch 1 is tripped causing flow of hydraulic fluid to stop.

CURRENT REGULATORS:

Located in the back of the large electrical panel are 4 electrical Current Regulators manufactured by Tryoller Hydraulik, Type 146, 20 KVM. These Regulators control the current voltage going to the solenoids located on top of the Hydraulic Valves, which inturn control the Lift, Basket Rotation, Tower Rotation, etc. of the ride. As more voltage is fed to the solenoid, the solenoid in turn causes the valve to open in a gradual manner until totally open and flowing maximum fluid. If the valves were allowed to immediately open the operation

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of the WAVE SWINGER would be rash and cause undue strain on components. The Current Regulators bring the voltage from zero to a maximum of 24 volts for full operation. The Current Regulators are adjusted so that it takes a few seconds before maximum voltage is fed to the solenoids, thus providing a smooth even flow of the WAVE SWINGER functions.

The timing for the current regulators is as follows:

| CURRENT REGULATOR | CLOSED TO OPEN | OPEN TO CLOSE |
|---|---|---|
| CLIMB | 4 seconds | 2 seconds |
| BASKET ROTATION | 5 seconds | 4.5 seconds |
| MAST ROTATION | 5 seconds | 4.5 seconds |
| TIPP | 2 seconds | 2 seconds |

Should one of the above operations just immediately stop working, locate the valve and solenoid controlling this operation. While the Pump is running, manually depress the solenoid; push down with finger to depress plunger. If the operation or function starts then the Current Regualtor is suspect.

If the operation or function does not start and plunger moves down, then valve is suspect.

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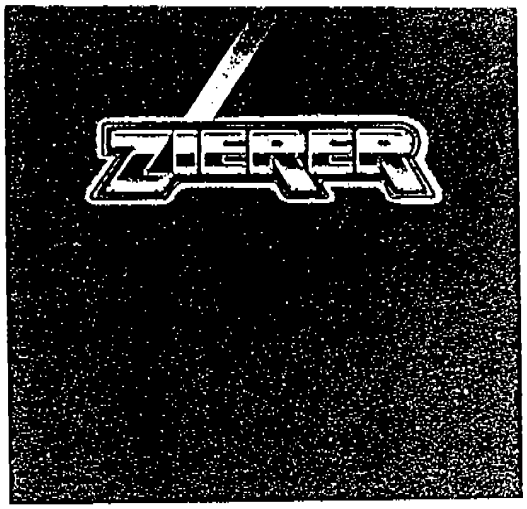


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If the Regulator is determined to be malfunctioning, test it by pushing the appropriate button on the control panel and read the voltage going to the solenoid waiting the correct number of seconds for full 24 volts to be obtained. If voltage is minimal or non-existent, replace Regulator after checking to see that Regulator is receiving incoming electrical service.

The Regulator controlling "TIPP" is rarely used as the "TIPP" button on Operator's control panel causes the Basket to slowly rotate. This is so that when only one person is operating the ride he may rotate the Basket looking at all riders making sure that all Lap Bars are in place before starting ride sequence. Have other personnel check Lap Bars, riders, etc. then give operator a thumbs-up sign, signaling all is ready for ride sequence to begin. Remove the Tipp Regulator and replace defective Regulator with Tipp Regulator, NOTE!!!!! Tipp Regulator must be readjusted timewise to properly control the ride function whose Regulator is defective. Example: If you replac the Basket Rotation Regulator with Tipp Regulator, it must be readju to give 24 volts for opening of valve in approximately 5 seconds and cutting down voltage for closing valve in approximately 4.5 seconds.

Adjustment is accomplished by turning small screws found on face of Regualtor. IMPORTANT!!! TURN ONLY THE SCREWS MARKED "ON" AND "OFF", nothing else. If in doubt, call service office.

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## HYDRAULIC CONTROL VALVES:

The main functions of the WAVE SWINGER are controlled by Hydraulic Valves. Normally the only problem associated with these valves is foreign debris lodged in them. Usually a removal and disassembly and thorough cleaning is all that is required to correct a malfunctioning valve. With the pump running and confirmation that 24 volts maximum are going to the valve solenoid, manually depress Solenoid Plunger, if correct function of ride does not begin, Control Valve is suspect. Remove, disassemble and inspect.

The following is a list of the valves, their type and maximum pressure that should be indicated while ride operating:

| FUNCTION | TYPE | MAXIMUM PRESSURE |
|---|---|---|
| CLIMB | DVB 20 P25 210 | 210 BAR. Approx. |
| TOWER ROTATION | DVB 20 P25 140 | 100 BAR. Approx. |
| BASKET ROTATION | DVB 20 P25 160 | 100 BAR. Approx. |
| BRAKE | DVB 10 P25 140 | 40 BAR. Approx. |

NOTE!!! The maximum pressure will only be attained for a few seconds as the greatest force is only required to start the different functio into motion then pressure will drop and hold. Age of the equipment,

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condition of hydraulic fluid, temperature and rider load are factors that will determine constant pressure required to keep functions operating.

The numbers 210, 140, 160 are the flow rates of the valves. Rotation speed of WAVE SWINGER is not adjustable as the flow rates of the valv control speed of rotation.

IMPORTANT!!!!!
Normal rotation speed of WAVE SWINGER is between 9-11 rpm.

OTHER VALES TO NOTE ARE PER THE FOLLOWING:

Lowering Valve, Type GR-2-3, has very large solenoid but no gauge. This valve allows Basket to return to loading/unloading position.

Disconnect Valve, Type A 3 E 1-P-M-105, works in conjunction with Brake Valve and Basket Rotation Valve.

BRAKE AND ADJUSTMENT:

Braking on the WAVE SWINGER is accomplished by supplying equal pressure to both sides of Hydraulic Basket Drive Motors or counter pressure. The operator presses on foot pedal activating Foot Brake Cylinder, Type M34D, pressure goes through Disconnect Valve, through

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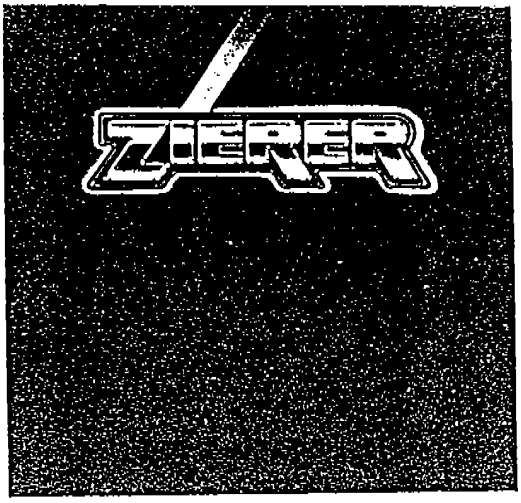


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Brake Valve and Basket Turn Valve creating counter pressure on Basket Drive Motors thus bringing them to a stop. Operator must use discretion when applying Brake as a rapid halting of Basket Rotation will cause Swing Chairs to collide.

ADJUSTMENT: Normally a certain amount of Counter Pressure is supplied to the Basket Drive Motors when Limit Switch 3 is tripped by the Basket returning to the load/unload position, however, when the ride is fully loaded the kinetic energy of the Basket will cause it to continue free spinning even after it has come to rest at its lowest position. A small application of the Foot Brake is normally required. If excessive movement is required, there are two threaded rods with nuts that may be tightened causing proper normal counter pressure. The threaded rods are part of the Foot Brake Pedal and located directly underneath the pedal itself. When all adjustment is used up, it is normally found that the Foot Brake Cylinder is leaking and not holding pressure to the Disconnect Valve, Replace Cylinder type M-34-D.

NOTE!!! Some creeping of the Basket is normal while it is in the load/unload position but riders should not have to walk to keep up with Swing Chairs while trying to get into them. If adjustment of Foot Brake Cylinder does not correct creeping and no abnormal leaking of Foot Brake Cylinder is noted, contact service office for further assistance.

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## VALVE BLOCK MANIFOLD:

The Hydraulic Control Valves for Brake, Climb, Basket and Tower rotation mount to the Valve Block Manifold. This is a machined component containing only passage ways for fluid flow. There are three (3 Back Flow Valves that screw into the rear of the Manifold for the Tower Rotation, Basket Rotation and Climb. It is possible for these Back Flow Valves to weaken as they consist only of a spring loaded ball that seats against a mating surface allowing fluid to flow in only one direction. If one of the above functions is abnormal, it may be possib that the Back Flow Valve is not closing completely, causing the malfunction. Remove, clean and inspect.

## THREE STAGE HYDRAULIC PUMP:

The WAVE SWINGER is equipped with a Three Stage Hydraulic Pump with one stage providing pressure for Climb, one stage providing pressure for Basket Rotation and one stage supplying pressure for Tower Rotation Should Current Regulators Control Valves and all other components show to be in proper operating condition but pressure shown on Control Valve Gauge be very low, the Pump Stage providing pressure for this function is suspect. Remove, disassemble and inspect.