

MFG: PINFARI  
NAME: ZYCLON LOOP  
TYPE: NON-KIDDIE

Zyclone (Pinfari Coasters)

Check tract anti-roll backs for cracks.

Check walking ramp up side of chain.

Check handrail on ramp.

Check blocking, base frame, bracing and brace wedges for keys.

Cars:

Check for seatbelt or lap bars.

Check front of seat bars for security and cracks.

Check car buffers for spring.

Check under cars for...

Tightness of bolts.

Chain catchers for wear.

Anti-roll back springs.

under track rollers for freeness and wear.

Brake irons for wear.

That moving brake iron has some form of hold back or stop if center bolts break.

That wheels have minimum 12 mm (1/2") sidewalls

Check that cars stop in emergency brakes.

Check that emergency stop buttons are at both ends of station.

Ensure that operators are familiar with emergency procedures.

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## Daily Inspection and Maintenance

### I. Station

1. Inspect Station Brakes.
  - a. Pneumatic components for leaks and damage.
  - b. Proper air pressure.
  - c. Condition of linings.
  - d. Tightness of all fasteners.
  - e. Proper function of brakes.
2. Check restraint harness limit switches for proper function.
3. Check operator control panel for proper function.
4. Check oil level in compressors.
5. Drain condensation from air system.
6. Check condition and function of sensors.

### II. Lift

1. Inspect lift chain and anti-rollback for wear and damage.
2. Inspect tail stock assembly.
  - a. Bearings.
  - b. Sprocket.
  - c. Shaft.
  - d. Tightness of all fasteners.
3. Inspect Lift Drive Assembly
  - a. Oil level in gearbox.
  - b. Tension of drive belts and condition of belt sheaves

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- c. Condition of drive chain - lubricate as needed.
  - d. Condition of lift chain idler wheel.
  - e. Condition of air bag.
  - f. Condition of bearings and sprockets.
  - g. Proper torque of all fastners.
4. Inspect lift crown head stock assembly.
    - a. Condition of bearings.
    - b. Condition of sprocket.
    - c. Shaft.
    - d. Tightness of all fastners.
    - e. Condition of mounting beams.
  5. Check condition and function of sensors.

### III. Safety Brakes & Trim Brakes

1. Inspect safety brakes.
  - a. Pneumatic components for leaks and damage.
  - b. Proper air pressure.
  - c. Condition of linings.
  - d. Tightness of all fastners.
  - e. Proper function of brakes.
2. Check condition and function of sensors.

### IV. Trains

1. Check condition of all wheels.
2. Check wheels for proper end play and proper oil level.
3. Check hitches for wear or looseness.
4. Check all fastners, safety wire, cotter pins, thrust washers and locking devices thoroughly.
5. Check to see that safety cables are in place and secure.
6. Check chain dog and anti-rollback dogs.

- a. Taper locks.
  - b. Shafts.
  - c. Return spring.
  - d. Nylon strip on anti-rollback dog.
7. Check condition of brake fins and mounting pins.
  8. Check function of all seat restraints to insure proper function.
  9. Check all fenders, arm guards to insure they are secure.
  10. Lubricate wheel carrier pivot bearings - small amount.
  11. Inspect coach under-carriages for cracks, or distortion, insuring that all fastners and locking wires are secure.
  12. Inspect all axle center spindles to insure they are secure; if there is any sign of looseness, disassemble and repair as needed.
  13. Check sensor shoe assembly for proper adjustment.

#### V. Track

1. The entire track system should be subjected to a close visual inspection of all tracks and support structure including welds, bolts and other fastners such as turn-buckles on cross-tie tension rods. This should be done daily by dividing the track in 7 sections to assure the entire system is checked on a weekly basis.
2. The track should be checked daily to assure the running surface is clean and clear of obstacles. Clearance of the track area as described in drawing, should be observed.

VI. Test run the ride to insure proper function of safety system and controls.

#### VII. General

1. Check ride lighting to assure proper function.
2. Check entrance and exit area.
3. Check ride fencing and que area.

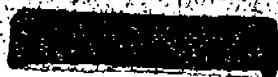
Installation and

maintenance

data of

the roller coaster

"ZAZELON"



Our batteries contain dry charged high active plates. If required they may be put into service immediately after filling with acid, without previous charge. Care to be taken for dry storage.

Fill to 5 mm above the separators or to the lower end of the acid splash preceptors with chemically pure sulphuric acid having a specific gravity of 1280 (32° Bé) measured at 20° C (68° F), in the tropics 1230 (27° Bé) at 28° C (82° F).

2- After filling check the specific gravity of the acid and its temperature. The temperature should not be below 20° C (68° F) and the specific gravity must be at least 1270 (in the tropics 1220). If both values are obtained, the battery is ready for use.

At outdoor temperatures below -5° C (23° F) and as far as an acid temperature of 20° C (68° F) after filling is not reached an activation charge of 30 minutes at the rate of 3 times the normal charging rate as specified under 6 becomes necessary.

3- The acid level in the single cell of a battery put into service as per section 2 has to be checked within one week and if necessary, to be topped up with acid.

4- Caution: If the specific gravity of the acid as prescribed in para 2 is not reached, an initial charge is required.

5- Caution: If the battery is not put into service within one week after its filling with acid, i.e. sufficiently charged by the generator of the vehicle, it is absolutely necessary to give the battery an initial charge.

6- The initial charge is to be effected at a rate of 1/20 of the battery capacity (for instance, 66 Ah : 20 = 3,3 A or 200 Ah : 20 = 10 A) Charging must be continued until the charging voltage remains constant at 2,6 - 2,7 volts per cell for 2-3 hours. Thereafter check again the acid level and adjust it, if necessary, by adding acid. Then continue charging for about further 15 minutes to mix the liquids.

During the charging process the battery temperature should not exceed 40° C (104° F), in the tropics 50° C (125° F). In case of exceeding these temperatures stop charging and let the battery cool down.

7- For subsequent recharges double charging rate as under para 6 is permissible. Until reaching the normal voltage (2,4 volts/cell) also higher current values are accessible.

8- The battery is completely charged if the charging voltage of 2,6 - 2,7 volts/cell and the specific gravity of acid of 1280 (in the tropics 1230) remain constant.

During subsequent service of the battery, the acid level should always be kept at the prescribed height. Only water evaporates! Therefore top up with distilled water only. The acid level has to be checked at least once a month, at especially hot days weekly.

10- Filled batteries if not in service, have to be recharged every

### 1 Ground preparation

To ensure a quick and accurate assembly and to guarantee efficient running of the ride it is essential that the base steel framework is laid true and level.

Whilst a spirit level can be used, it is preferable to level the base with a 'dumpy' level as used by a surveyor.

When placing packing to level the base or siting concrete piers for the same purpose make sure that they are located directly under where the structure uprights will be located.

### 2 Erection

The bents or jackstands should be erected in the order as shown on the drawing of the spare parts manual.

It should be noted that the sections of track which are used to assist the rearing of the bents have two hooks welded on the side of the equal angle, and these are numbered in blue.

Check the number of each track piece as erection progresses and never use force to locate any section.

This also applies to the wind braces note that before rearing the bents it is possible to set the light units on top of the posts whilst they are still laid on the ground.

The same method can also be used for the tower framework.

When all the structure is in position fit the straining rod assemblies to both circles locating them in the hooks provided and adjusting them for tension with the turnbuckles provided.

Complete the fitting of all bracings.

Finally, fit all the pieces required for the station, entrance, and cantilever roof.

The scenic pieces, panels etc are fitted by hand, and any pieces not numbered are of such shape or design that their location is obvious.

### 3 Electrics

Connect the various cable to the terminal block of the main switchboard taking care that correct connections are made by referring to the circuit diagram enclosed.

It is essential to provide a good earth (grounding) for the ride. Finally connect the supply to the switchboard separating the power line from the lighting line.

### GENERAL SAFETY RULES

1. The switchboard must be correctly connected to a sound reliable earthing (grounding) cable for protection against accidental short circuits.

2. For the protection of the structure particularly permanent locations against atmospheric discharge (lightning) it is essential to provide steel or copper grounding piles which should be connected to the structure with 50 mm dia minimum copper wire and paralleled together provide one pile for every 25 m of perimeter of the ride with a minimum of three.

3. The owner or operating manager of the ride must display in a prominent position such safety rules for members of

the public as may be required by general accident prevention regulations of the state or country or such safety rules as the owner or operating manager deems necessary to control and safeguard the conduct of the public.

- 4 If the ride is erected on sloping or uneven ground a check should be taken around the ride to make sure that the public cannot enter inside the perimeter and if necessary extra fencing or similar devices should be provided to ensure this.

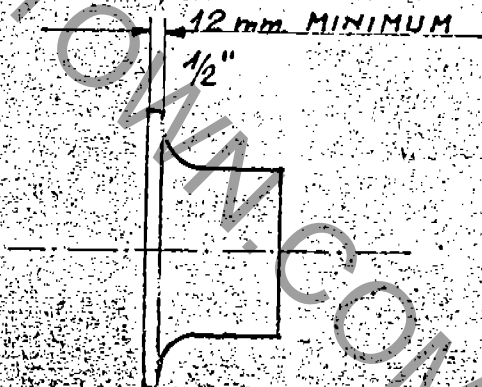
#### COMMENCEMENT OF OPERATION

- 3.1 Before starting to run a check should be made to ensure that there is no obstruction on the track to prevent free movement of the cars.
- 3.2 The whole track must always be kept clean from atmospheric dust, sand etc and from any grease droppings left by any other maintenance carried out on the ride.
- 3.3 Check the working efficiency of all motive parts. I.E. chain, chain motor, brake chain, emergency brakes, check brake and also check the voltmeter on the switchboard panel to confirm that the correct voltage is being supplied to the ride.
- 3.4 Check every time the ride is open if every blocks is properly located under the base in the bearings points.
- 3.5 To keep the batteries of the car always working when you have a busy day keep on the charge battery set during night hours.
- 3.6 Check battery electrolyte level once a week. Top up with distilled water as required.
- 3.7 Check once a week brake chain tension and some of this must touch the runway built on purpose. There is a special device to rise up or put down the chain in function of its tension (see dwg page ). Don't remove part of the chain until you see that you need.
- 3.8 Lubricate once a week the rollers of the brake chain
- 3.9 Every day be sure that the dog on chain catches on each car and roller. Lubricate them once a week.
- 3.10 Run a check on the electrical circuit before opening.
- 3.11 Check that all emergency brakes be adjusted for four people
- 3.12 Visually check every day that every resp platforms, station platforms, brace and their safety clips, base pins, electrical cords be in their place.
- 3.13 Check every day the function of the cable that adjust the of the safety bars.  
In case the safety bars don't work.
- 3.14 Absolutely one car should follow the other one after words 18" for obvious reasons of safety.
- 3.15 In case you have an emergency and all cars are stopped in the brake. To renew the normal situation free the first car nearest to the arrive section of the station, and consequently the others following the same order.

MAINTENANCE

Car Maintenance

- 4 1. Once per week, lubricate oil nipples paying particular attention to the point n°064 (see page 6) once per fortnight lightly lubricate the point n°068 (see page 6) using a vaseline base grease.
- Always keep the two pins of the chain hook (see page 10) lubricated with oil, and check that when the hook is lifted it can fall back again easily to its working position. The same applies to the anti-rollback device (see page 10) and this unit is assisted to return to its working position with a spring keep articulated joints of the mobile jaw of the brake free from dust etc (see page 10) and lubricate with a little grease.
- The adjustment of this jaw takes place by unscrewing the bolts 01292 to provide more or less pressure. When the adjustment has been made retighten the nut 0128. Periodically lubricate with oil the spring buffers 0132 (see page 13) so that they move easily, assisted by the spring fitted inside.
- Every 1000 hours or six months, whichever is the less, check the external flange thickness of the nylon wheels. The dimension of this must never be less than 12/13 mm. and when the wear reaches this stage the wheel must be replaced.



to change a nylon wheel, unscrew the threaded ring nut by using the special spanner provided in the kit, turning it in an anticlockwise direction for the nuts marked "R" and in a clockwise direction for those marked "L" remove the two selfthreading screws located behind the hub and withdraw the worn wheel, bearing in mind that the wheel hubs marked "R" are mounted on the ring-hand side of the car and those marked "L" on the left-hand side, "R" "L" being considered in relation to direction of travel of the car.

#### 4 2 Maintenance of chain motor reduction unit

Change the connections to the motor whenever the supply voltage is changed. Periodically check "V" belt tension and adjust as required by means of the adjusting screws to the motor bed. Periodically check the oil level in the gearbox change the oil after the first 500 hours running using SHELL 90 E.P. oil or equivalent change oil every 3000 hours thereafter

#### 4 3 Chain maintenance

Afterwards the first adjustments of the chain you must do a new adjustment of the tension to avoid the trouble of the jump of the one teeth that is caused by the lengthening of the same one after a short time you can see the reduction of the phenomenon. Once weekly lubricate the sprocket teeth of the chain wheel and also the chain support trough with thick oil. Turn the chain over whenever it is noticed that only one side of the chain is wearing, through contact with the trough both sides constant wear is thus achieved.

#### 4 4 Hydrodynamic (hydraulic) coupling

To increase the controlled rate of slip it is necessary to drain off a small amount of oil, but caution should be exercised as reducing the oil quantity increases the working temperature and it is essential that the casing temperature does not exceed 80/100° C (175/200° F) recommended oil for

SHELL	TURBO OIL 29
ESSO	TERESSO 43
AGIP	F1 OSC 25
MOBIL	MOBIL OIL DTE 797
BP	ENERGOL HL 65

## MAINTENANCE

Check the oil level periodically and change oil once a year.

In order to obtain correct level of oil, the filling plug should be in upright position (12 o'clock) fill until overflow from filler hole.

Check periodically for oil leakages.

### 4.5 Brake unit gear motor maintenance

Change the connections to the motor whenever the supply voltage is changed.

Check the oil level in the geared motor and replace it after first 1000 hours running with SHELL "MACOMA"72 or equivalent.

Normal oil changes thereafter at 3000 hours running intervals.

Keep the brake chain lightly lubricated through the holes in the rollers using a few drops of colloidal graphite oil.

To regulate the controlled slipping of the clutch it is necessary to adjust this by using the special hook spanners provided on the two ring nuts located on the main shaft by the sprocket wheel.

Lubricate the friction bearing through lubricator N°219 (see p21) using a little grease once a week do not overlubricate as the grease could affect the surface of the friction plates causing excessive slipping and inefficient braking.

Should this occur it is necessary to dismantle the unit (see p 21) and thoroughly clean all the parts with a volatile oil solvent.

### 4.6 Maintenance of brakes located on the track

Keep all check pins levers and working parts free from dust, oil and rust deposit, but at the same time keeping them correctly and lightly oiled.

Before commencing it is desirable to check all brakes for working efficiency by operating them from the emergency brake button located on the control panel in the station.

### 4.7 Adjustment of the argument

The argument of the brake must be set on the car and brake chain.

The adjustment must be done partly on the brake jaws under the cars and the brake friction plate, so that a car approaching the brake at a normal running speed should slip on the brake chain for 3/4 of the length in the remaining 1/4 of the length the car should be gripped by the brake chain so that the car is conveyed into the station at the correct and controlled speed.

The above adjustment should be carried out with a loaded car of 6 people and adjusting xxN°129 by means of the four set screws N°1292 and also the friction plate on

the brake wire (N 017) by means of the long wire (N 017 and N°0218 page 21).

After getting the ideal operation by these adjustments the spring of the brake on the track must now be adjusted. These brake springs are connected and hold in tension by turnbuckles which adjust the brake an empty car should be used for this adjustment and it should be so done that of the speed is taken out of the car and it arrives at the brake chain at moderate speed.

When it is apparent that most cars will ride full with a people the brakes must be increased in efficiency.

All the emergency brakes can then be adjusted in relation to the jaw widths of the cars and each of these should be tested each day with a fully - loaded car.

#### POSSIBLE TROUBLES AND SUGGESTED REMEDY

##### Reduction unit oil leakage

Oil leakage are caused mainly from the seals on the shaft of the reduction unit check and renew.

##### Electric brakes trip device does not

Check that coil is connected to plug and plug to feeding circuit in switch board.

Triangular sliding blocks not clean, preventing free movement.

##### Car does not complete the circuit

Check track and wheels for obstruction.

Wheel hubs over greased.

##### Car does not stop in brake chain

Friction area of unit heavy or dirty, dismantle and clean with solvent.

Check jaws under cars.

##### Battery charging circuit shorting

Check pickups under cars which may be out of line.

Due to an external cause realings, check and then reset

charge unit by depressing "automatic" button on charge unit.

INSTRUCTIONS FOR THE BRAKE SET

ADJUSTMENT UNDER THE CARRIAGE

From the drawing enclosed see page n°1A you can see clearly that the adjustment is obtained moving the movable shoe brake (M') in accordance with the arrows marked on the dwg.

The adjustment when you have a new brake set that means you have a new brake chain, shall follow this rules put between the two brake shoes (M) and (M') a wood parallel block that must be exactly 48mm.

Afterwards turn with the force of the hands the screws (A) (C) (D) (E) till that the brake shoe lays on the wood block, then tighten very strong the lock - nuts (A') (C') (D') (E') with opening wrench, and then tighten the nut (H') that just must lean on the iron section.

In this case the brake chain (width mm 51) must have to put into the brake shoes under the carriage (width mm 48) see size (K) will cause a remarkable braking action, creeping strongly on the two brake shoes.

So after many hours working, the brake chain, will show a wear appreciable that it does not brake any more the car. We have to intervene for a new adjustment of the size "K" that shall always be inferior of 3mm. of the the width checked on the brake chain worn. To make easy this operation we suggest you to built a new parallel wood block as above said.

After this operation you need to a djust all electric and mechanical brake on the runway in accordance with the new distance between the shoes (M) and (M') of the brake set. Keep always clean these under the carriage shoes for oil or diesel oil.

## INSTRUCTIONS FOR THE ADJUSTMENT OF THE

### ELECTRIC - MECHANICAL BRAKE

From the drawing page 2 A now we can describe this mechanism. The two friction shoes setting under the carriage see page 2 A interfering in the two details (E) and (D) of the brake above said causes a braking action, or stopping action this depends if the detail (D), is free to run over in accordance with the arrow or if blocked from the stopping square device in the position (B).

Normally this stopping square device is in the position (B) allowing to the detail (D) to run over, and to slow down the car. By means of the turn buckles (G) and (G') we will be able to adjust this slow down braking action, taring the tension of the aprings (F) and (F').

In case after having acted on the turnbuckles to increase the braking action of the device, you don't reach any results you will need to increase the width (H), acting on the adjustable screw (A), previous loosening of the nut (A'), till you, find a new width (H) that can brake, slowing down the car.

In the other case we can stop the car, when we push the emergency button, indeed we have the stopping square device in the position (B) so that the detail (D) will be prevent to run over, and the friction shoes under the carriage will interfere completely in the two details (E) and (D) of the brake above said. To free the car or the cars train operate, at the bottom of the bent, on the two levers built on porouse always check the screw (C') that must be lay to the stopping square device in the position (B) to have an immediate intervention in an emergency case. Check every time, the wear of the flat brass strip on the running angle device, and be sure that no spots of oil or diesel oil are on the friction surfaces.