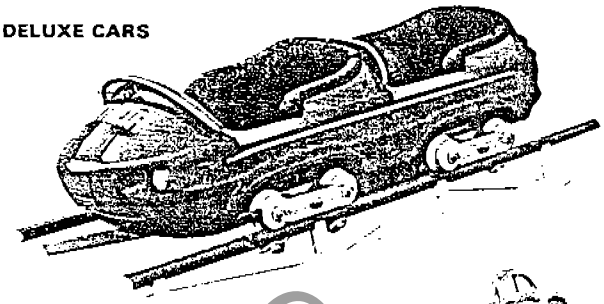
MFG: SDC
NAME: GALAXY ROLLER COASTER
TYPE: NON-KIDDIE

Exsaco Corporation
1103 Rose Avenue • Dallas, Texas 75202 U.S.A. • (214) 742-3902
Cable Address "DUCE-DALLAS" • Telex No. 730300

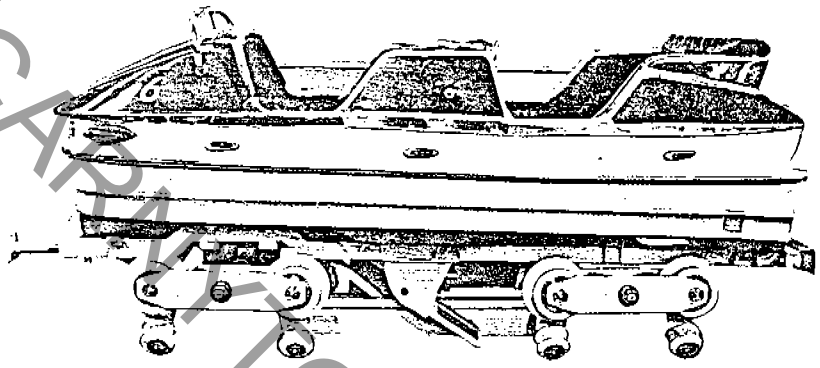
GALAXY

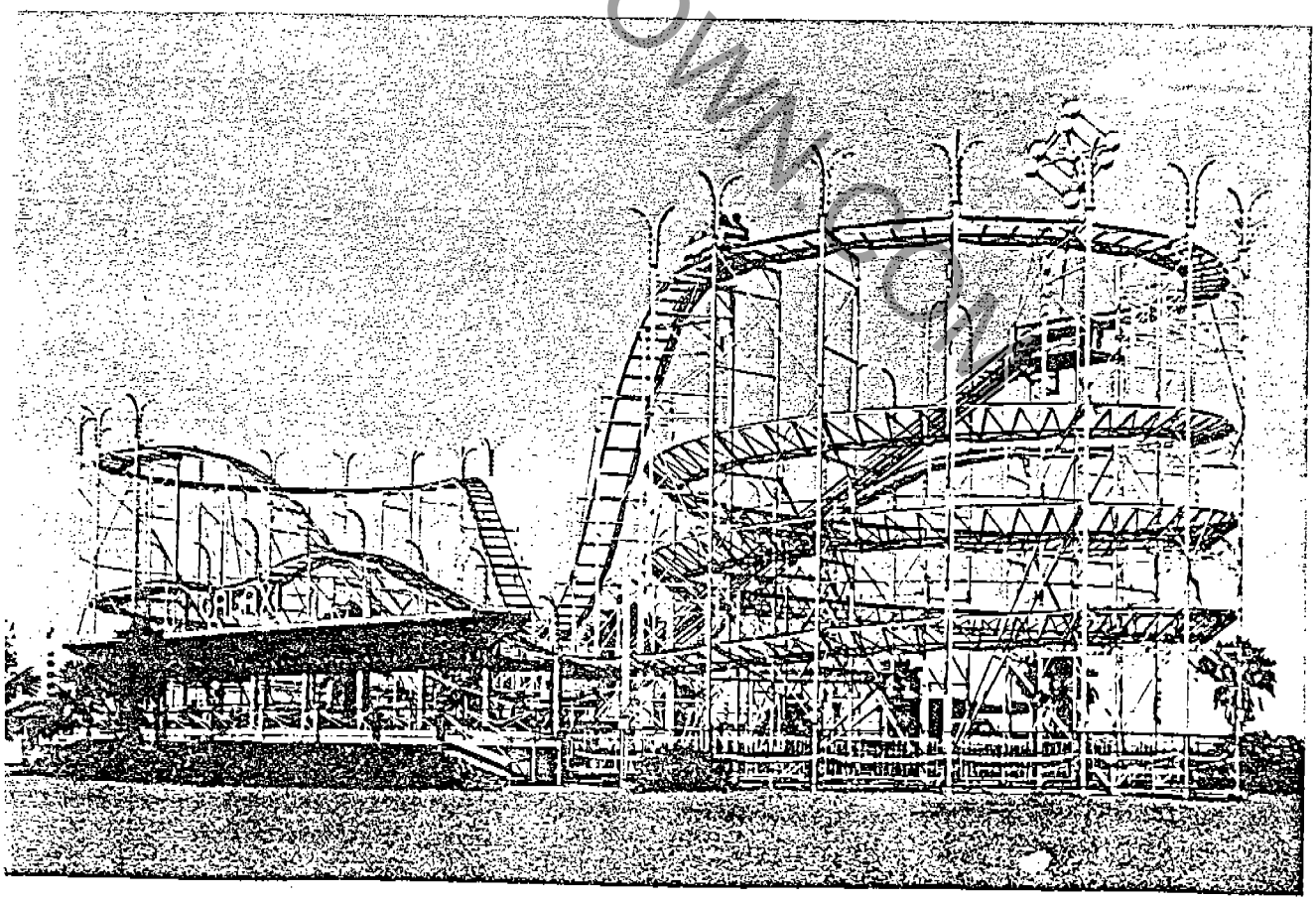
ALL STEEL . . . HIGH SPEED ROLLER COASTER— The Galaxy provides a Star Attraction 62 feet high. Eight cars carrying four passengers each race over 1/4 mile of tubular steel track. Attractively styled cars are constructed of steel and fiberglass with stainless steel trim, and move on quiet, fast teflon wheels. Brakes are air operated, spaced throughout the ride for positive control and safe operation. 100 fluorescent tubes and 3,000 incandescent lamps light the Galaxy and attract thrill seeking customers.

DELUXE CARS



STANDARD CARS





Exaco Corporation
103 Ross Avenue • Dallas, Texas 75202 U.S.A. • (214) 742-3802
Cable Address: EXACO-DALLAS • Telex No. 730300

GALAXY SPECIFICATIONS

SPECIFICATIONS

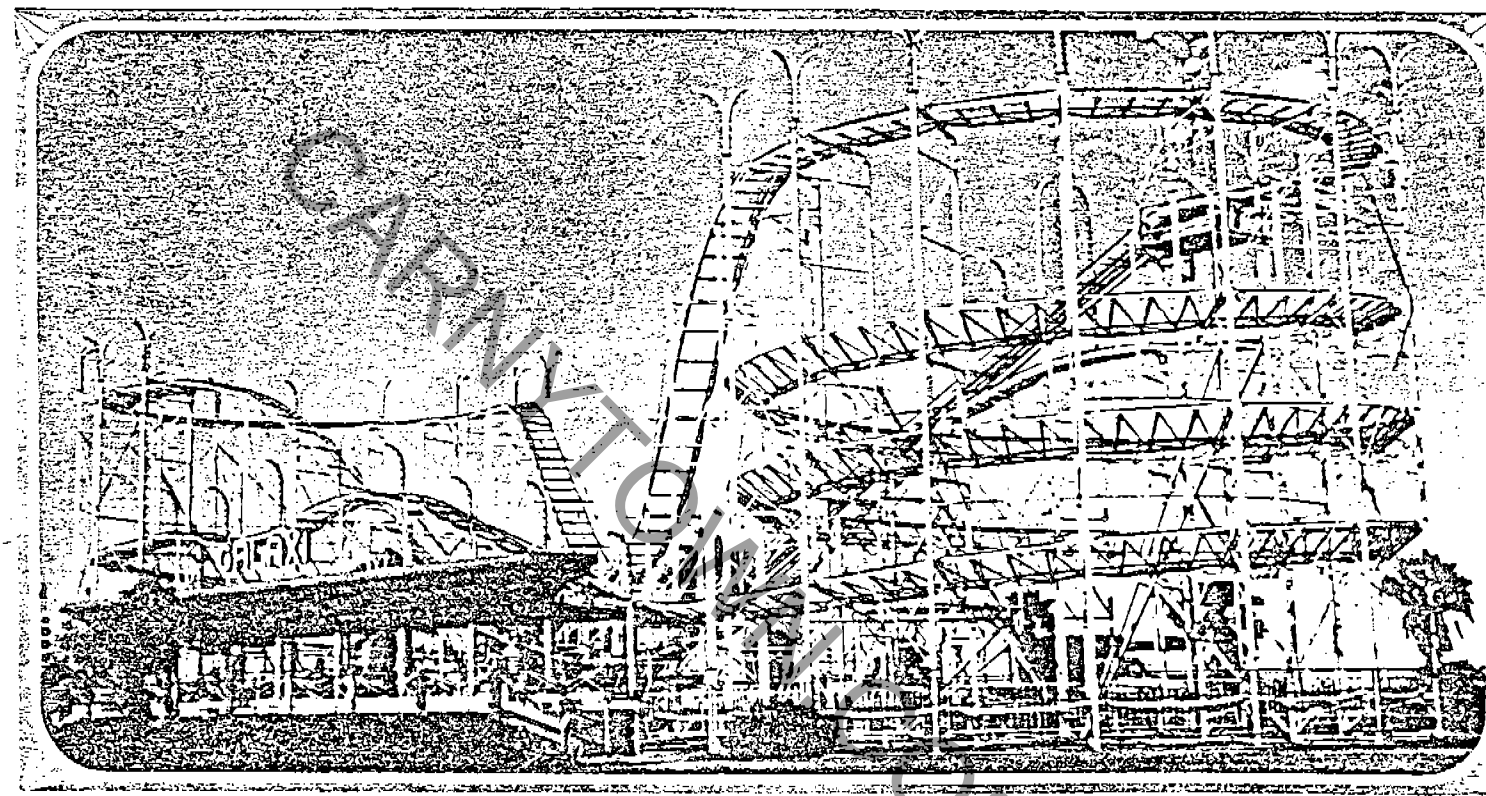
DIMENSIONS:	Length—167' Width—60' Height—Track 45'—Overall 62'
WEIGHT:	144,000 lbs.
TRACK LENGTH:	Over 1/4 mile (1640')
SEATING:	8 Cars—4 passengers each—Fiberglass and steel cars with stainless steel trim—Teflon wheels for quiet operation
CAPACITY:	1,000 per hour
CONSTRUCTION:	Finest Italian styling and workmanship Tubular steel track and square tubing uprights—Extensive use of plastic and fiberglass
ELECTRIC REQUIREMENTS:	All electric 220/440 volt, 60 cycle, 3 phase motors, lighting, panels to American standards
MOTORS:	1—15 HP—Chain lift 2—1 HP—Kickoff—speed equalizer 1—Air compressor
LIGHTING:	100—fluorescent tubes 3,000—incandescent lamps (11s/14—bulbs not included)
SIGN:	Flashing sign with running lights
TOTAL POWER REQUIREMENTS:	65KW—3 phase
BRAKES:	Air operated—11 service and emergency brakes spaced throughout the ride for positive control—Safe operation
INSTALLATION:	On-site supervision by factory trained technician

PRICES AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

SDC

R O L L E R C O A S T E R

Use and maintenance



The information and illustrations in this catalogue are not binding.

S.D.C. s.r.l. reserves the right to modify the equipment at any moment and without advance warning, whenever technical or commercial necessities so require.

INTRODUCTION

This use and maintenance catalogue has been prepared by S.D.C. in order to facilitate the management of the equipment and give hints on several special operations thanks to which the amusement will offer maximum efficiency with the least waste of physical and economic energy.

Before carrying out any operation, we strongly recommend that this manual be carefully read as this will ensure the correct and rational accomplishment of every intervention.

GENERAL FEATURES

The amusement mainly consists of a METAL LATTICE STRUCTURE which supports a TRACK on which run eight 4-place CARS.

A car departure and arrival STATION.

A system of CAR-PUSH units for movement and ascent to the highest point (Tab. 3).

A BRAKING system (Tab. 4).

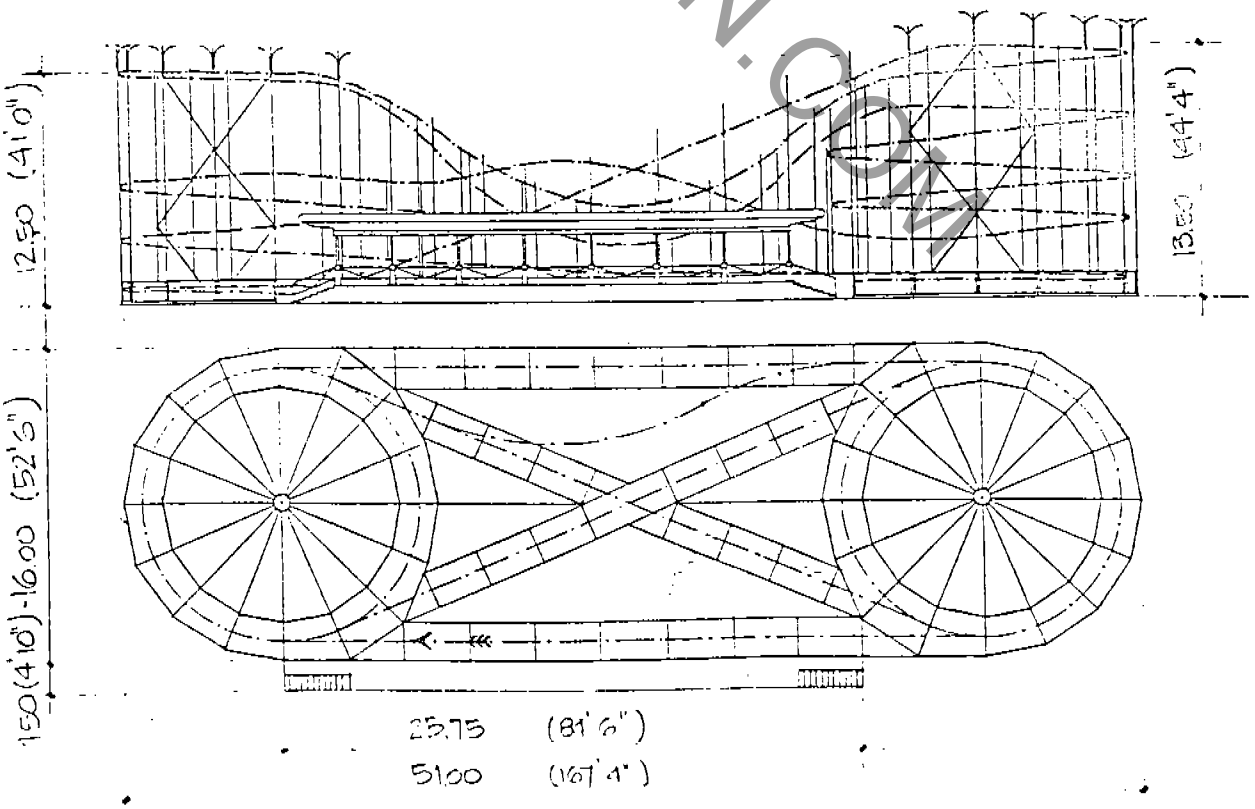
A BRAKE OPERATION system (Tab. 6-7).

An ADDITIONAL SAFETY BRAKING SYSTEM (Tab. 7 fig. 2).

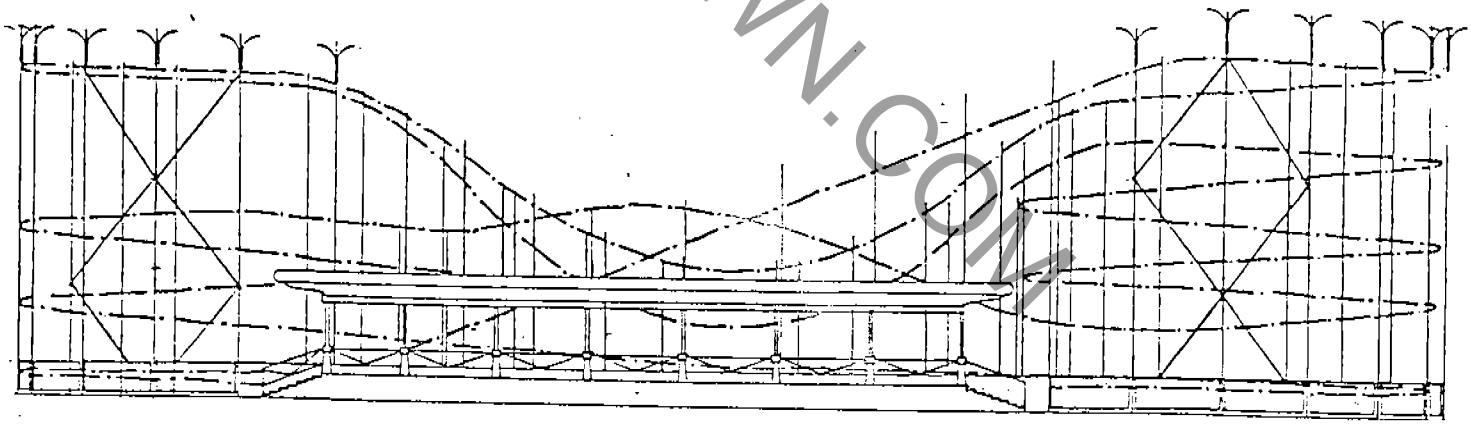
A "RACK" type safety system along the ascending tracks in order to prevent the cars from backing (Tab. 14).

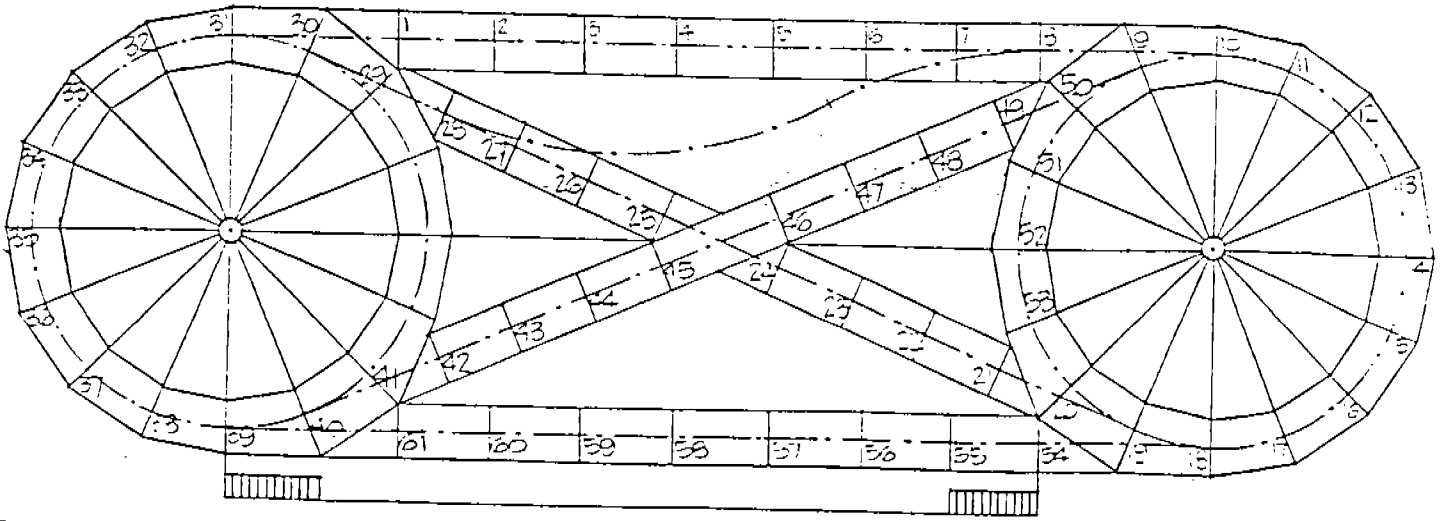
An electric panel distributing LIGHT AND MOTIVE POWER (Tab. 24).

DIMENSIONI D'INGOMBRO
OVERALL DIMENSIONS
DIMENSIONS D'ENCOMBREMENT

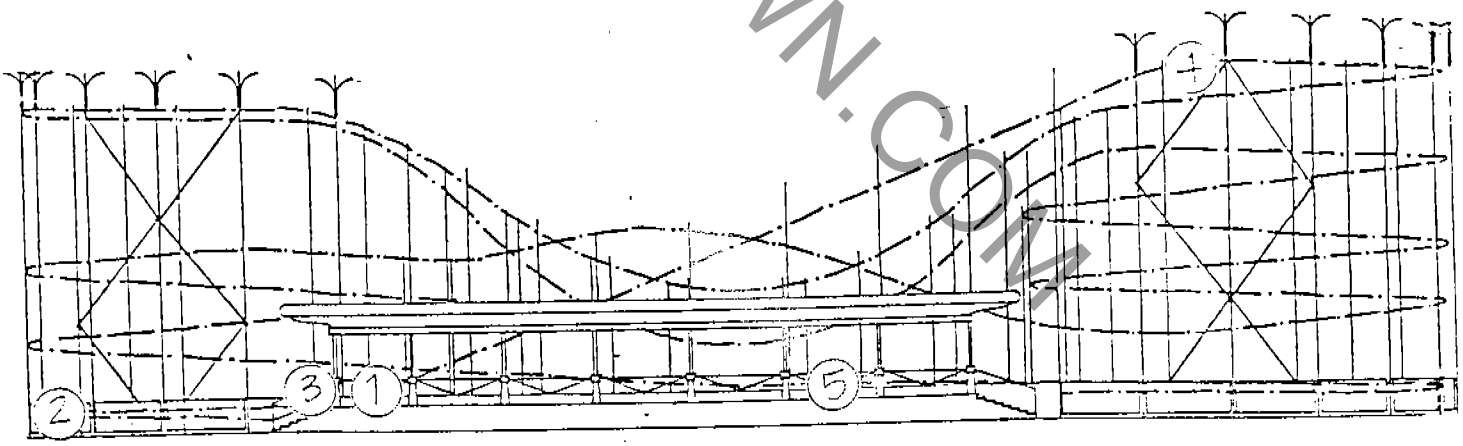


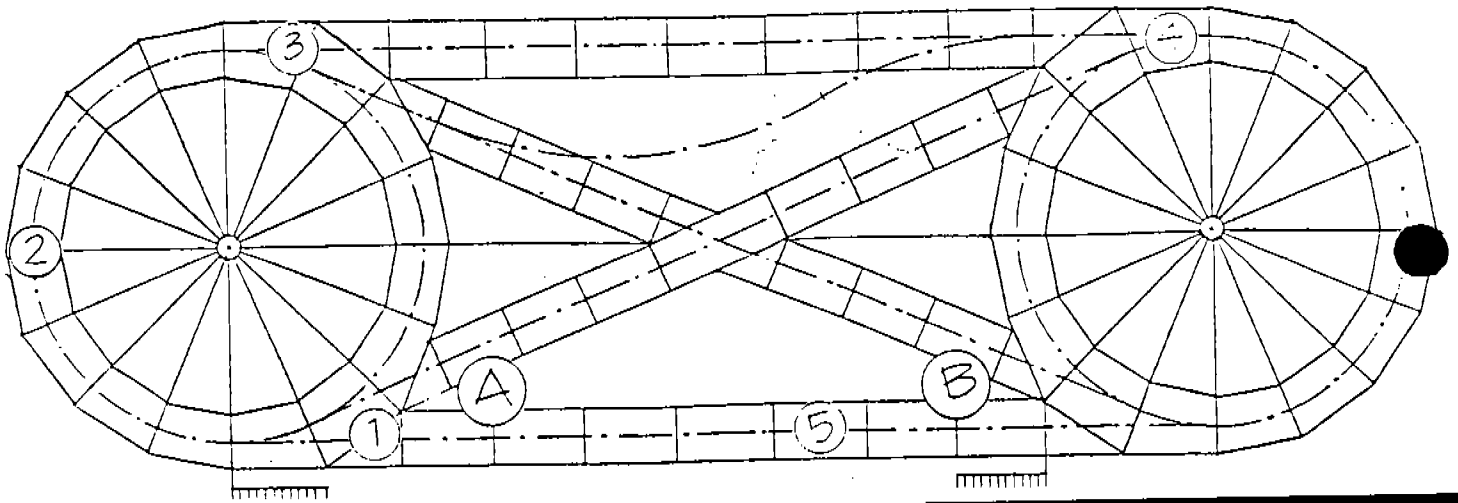
POSIZIONE "CAVALLE"
"JACKSTANDS" POSITION
POSITION "CHEVALETTES"



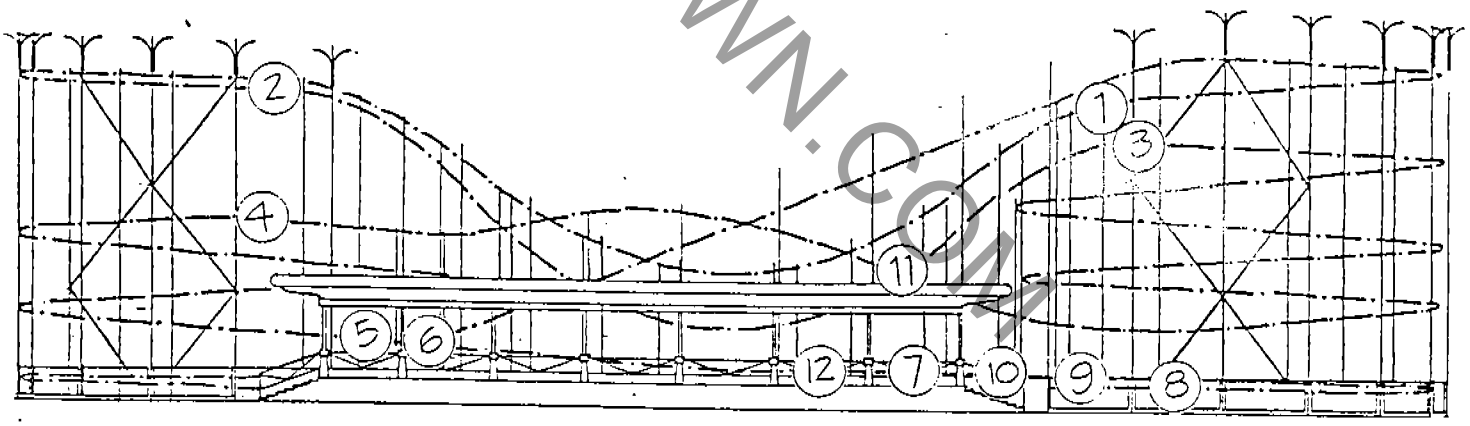


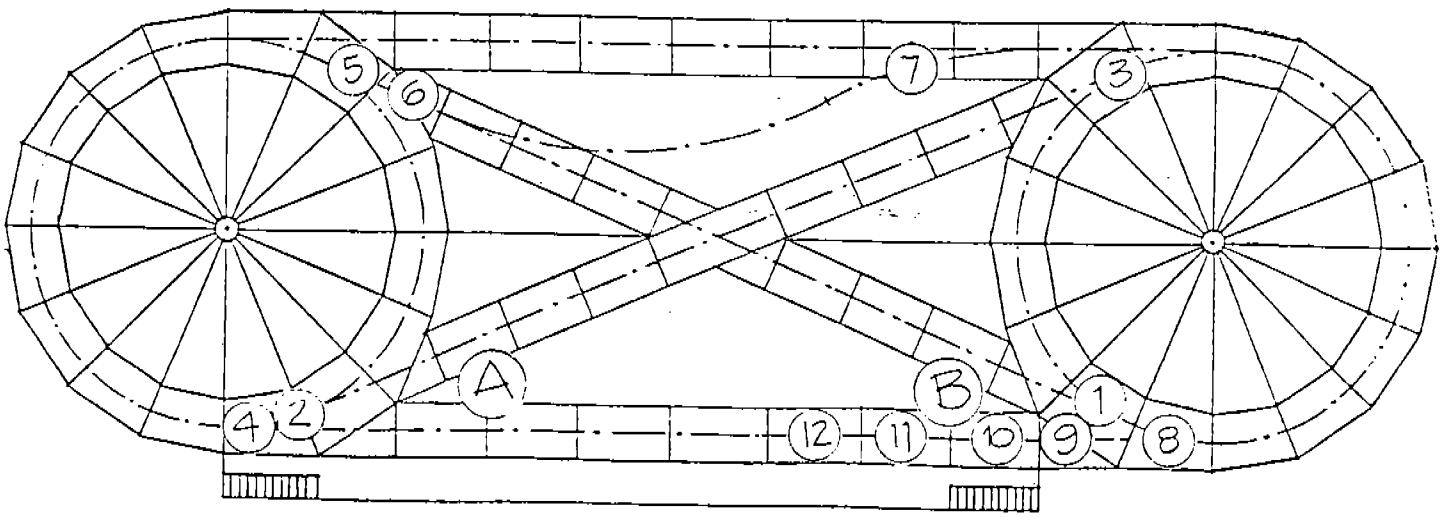
DISLOCAZIONE GRUPPI SPINGIVETTURA E COMANDI
CAR-PUSH AND CONTROL UNITS POSITION
DEPLACEMENT GROUPES POUSSE-VOITURE ET COMMANDES





DISLOCAZIONE FRENI E COMANDI
BRAKE AND CONTROL BOARD POSITION
DEPLACEMENT FREINS ET COMMANDES





FOREWORD FOR OPERATION

2 operators are necessary for operation.

The first, in position A (Tab. 3-4) operates the levers that control:

- car starting
- control of brake 1-2-3-4-5-6-7
- brake adjustment
- safety shackle closing

The second, in position B (Tab. 3-4) operates the controls that act on:

- the brakes 8-9-10
- brake 12 automatically connected to car-push unit No. 5
- the additional safety braking system (Tab. 7 fig. 2)
- the hand-operated lever operating brake 10

SPECIFIC TASKS OF THE OPERATORS

TASKS OF THE POSITION "A" OPERATOR

1) Switch on the main switch on the electric distribution panel and start the compressor via the switch (Tab. 24).

2) Start the geared motor which in turn, will operate the chain and driving wheel, using the switch.

3) Start the geared motor using the switch.

4) Operate the geared motor input switch.

5) Using the pressure gauge pertaining to the brake control block 19 (Tab. 6), check that the pressure on the brake circuit is that suitable for operation (6-9 atm).

   (The above mentioned operations should be accomplished once when the amusement is started).

6) Close the car safety shackles (Tab. 22).

7) Operate the car drive unit.

8) Conduct the brake control unit at the start (Tab. 6).

TASKS OF THE POSITION "B" OPERATOR

1) Operate the manual lever controlling brake No. 10.

2) Operate the lever which disengages brake No. 12 and contemporaneously operate geared motor unit No. 5.

3) Conduct the brake control unit at the arrival (Tab. 7 - fig. 1) and the emergency brake control unit (Tab. 7 - fig. 2).

OPERATIONAL DESCRIPTION

The passengers get into the cars (minimum 3 maximum 4) in zone A (Tab. 3-4).
The operator allows the SAFETY SHACKLE (Tab. 22) to descend and this locks the passengers in the car in a seated position.
Lever 18 Tab. 6 of control "A" will start the CAR-PUSH GEARED MOTOR UNIT No. 1 (Tab. 3) which will initially drive the car.
This unit (see detail Tab. 8 fig. 1) consists of an electric motor, worm screw reduction unit, pin and wheel.
It operates via the tyre directly on the wooden beam 9 (Tab. 15) under the chassis.

A slight track slope will accompany the car until it reaches the CAR-PUSH UNIT No. 2 (Tab. 3) which differs from the previous unit only by the greater number of revolutions.
This unit operates continuously and enables the car to reach the....

ASCENT START UNIT No. 3 (Tab. 3).
This unit (see detail Tab. 10) consists of a PINION SHAFT, WHEEL SHAFT, WHEEL AND CHAIN.
Via this last, it couples TOOTH 11 (Tab. 15) under the chassis; acting again on the BEAM, the tyre 9 (Tab. 15) facilitates this operation.
The car then ascends until it reaches the top, attaining and overcoming the highest point while still being coupled.
Only a few decimeters beyond, where the descent part has already started, will the chain leave the car which continues running due to the force of gravity.

The above mentioned chain is operated by a CHAIN DRIVE UNIT No. 4 (Tab. 3) consisting (see detail Tab. 11) of an electric two-speed motor (enabling the use of two coupled cars), a reduction unit, pinion with flexible coupling.

- The higher speed is utilized with the single car
- The lower speed is utilized with the coupled cars

From this moment onwards (until arrival in the station), the car has no need for propulsion; it does, however, need the BRAKING AND STOPPING SYSTEM (Tab. 4) both in order to adjust the speed and to stop if required.

There are different types of brake (Tab. 12): the first (Tab. 12 fig. 1) operates as an emergency device, locking the car on the brake itself if necessary.
(It is always open, has a pneumatic cylinder to close it and two springs to reopen it once used).
Brakes 1-2-3 situated in points 1-2-3 of Tab. 14 are of this type.

The second type of brake (Tab. 12 fig. 2) operates normally as a slowing brake thanks to the springs which more or less firmly clamp the jaws between which blade 16 (Tab. 18) fixed to the car passes, but they can also be closed via the two levers of control system "A" which will consequently stop the car on the brake itself.
According to its position, this type of brake is identified by numbers 4-5-6-7 and is situated in points 4-5-6-7 of Tab. 14.
The Spring and plungers are initially set in the S.D.C. workshops; it is, however, possible to vary the intensity by operating in the way described in the relative chapter (INSTRUCTIONS FOR BRAKE USE AND ADJUSTMENT).

The third type of brake (Tab. 12 fig. 3) is structurally identical to the previously mentioned type and is operated from control position "B".
It is situated in the arrival station and is identified by numbers 8-9-10-12 of Tab. 14.
This sequence of three brakes normally closed by the springs alone, is regulated so that the car will stop as smoothly as possible.
It is, therefore, a "progressive closing" from brake No. 8 to No. 10 which enables the car to stop on the last.
In this case, the plunger serves to open this brake.
Besides by the lever in control unit "B", brake No. 10 is also opened by a manual mechanical lever beside the operator.
If the car should stop on No. 8 or No. 9, other two levers of control unit "B" operate on the relative opening cylinders.
Once the brake has opened, the car will slowly proceed thanks to a slight track slope, until it reaches the CAR-PUSH GEARED MOTOR UNIT No. 5 (Tab. 3) positioned just before the BRAKE No. 12.
These two components act in concomitance and are operated by operator "B" when brake 12 is opened, automatically starting geared motor 5 and allowing the car to proceed forward for a further passenger load.

"RACK" TYPE SAFETY SYSTEM

Besides the braking system designed in order to block the car in case of emergency and to moderate the speed during operation, there is a "RACK" type safety system along each track ascent.
This item prevents the cars from backing downhill is (for various reasons) there is not sufficient inertia to overcome the ascent.
One of these racks (not visible to the operator like the others), has been automatically connected to the previcus brake (No. 11) which consequently acts without requiring an intervention from the operator himself (consult the AUTOMATIC BRAKE chapter for more detailed explanations).
For safety reasons concerning the distance between the cars, the time between one start and the next must not drop below 18 seconds.
18 seconds is the average time employed by the car to approximately reach half way up the initial ascent: this means that the operator must start a car when the preceding one is exactly in this point.

TYPE AND POSITION OF THE CAR-PUSH UNITS

(see Tab. 3)

UNIT 1 (Geared motor)

On starting, this starts the car.
Has 1400 rpm engine.

UNIT 2 (Geared motor)

Installed half-way between the station and the ascent chain.
It is designed to allow the car to proceed to unit 3.
It differs from unit 1 owing to its 2800 rpm engine.

UNIT 3 (Ascent start)

This facilitates the phase during which the car is coupled to the chain.
It does not have its own engine but is driven by the chain of unit 4.

UNIT 4 (Chain drive)

At the top of the ascent. This is the mechanism that operates the chain and, consequently, unit 3.
The two-speed electric motor enables the use of two coupled cars.

- high speed = single car
- low speed = coupled cars

UNIT 5 (Geared motor)

At the station arrival zone just before brake No. 12.
It is designed to allow the car to proceed once the passengers have descended.
It is connected and operates after brake 12 has opened and differs from units 1 and 2 owing to its SELF-BRAKING 1400 rpm electric motor.

DESCRIPTION OF THE SELF-BRAKING SYSTEM

The Rollercoaster is equipped with brakes designed both to slow the car along the track and to stop it at its arrival in the station or, in case of emergency, also along the track itself.

These brakes consist of two "L" sections to which a brake lining belt or bronze plate is fixed.

The brake leaf fixed under the car passes between these 2 "L" shaped pieces; by nearing to each other, these "L" shaped pieces tighten the car brake leaf between them, allowing travel to slow or stop according to the exercised pressure.

The nearing of these two "L" shaped pieces is accomplished by pneumatic plungers or springs, according to the type of brake.

The braking system consists of a compressor which sends compressed air to a main control "A" situated in the car start zone and to a secondary control "B" situated at the car arrival zone by which it is possible to control the plungers of each brake via distributor valves.

LAYOUT OF THE BRAKING SYSTEM

BRAKES Nos 1-2-3 (emergency)

Always open. They close in the event of emergency and block the car on the brake itself.
The system consists of a pneumatic plunger to close the brakes and springs to open them.
The brakes are operated by CONTROL UNIT "A".

BRAKES Nos 4-5-6-7 (for slowing and emergency)

Normally half-closed or open to slow or not slow the car; they can be totally closed to block the car via the pneumatic plungers.
The two pneumatic plungers (one to close and one to open) and the two springs are set to sufficently close for possible slowing.
They can be remote controlled by CONTROL UNIT "A".

BRAKES Nos 8-9-10 (for station arrival)

Normally closed in progression (less No. 8, more No. 10) by the set springs only.
The pneumatic plunger opens them.
They are controlled by CONTROL UNIT "B".

BRAKE No. 11 (Automatic)

Always open. This automatically closes via a pneumatic plunger.

BRAKE No. 12

Always closed by the set springs only. A pneumatic plunger opens them.
The brake is operated by CONTROL UNIT "B".

BRAKES TO BLOCK THE CARS
(used in the event of emergency)
Tab. 12 fig. 1

Brakes Nos 1-2-3 are of this type

Springs 4 are mounted in order to keep the brake in an open position.
The car normally passes freely. Only one plunger 1 is mounted; when necessary, this will block the cars by acting against the springs and closing shoes 8.

SLOWING AND EMERGENCY BRAKES
(Tab. 12 fig. 2)

Brakes Nos. 4-5-6-7 are of this type.

Springs 4 are mounted so as to keep the brake in the always closed position (shoes 8 neared).
Plunger 1 is mounted as as to help the action of springs 4 and tends to close the shoes, appropriately regulating the work pressure to plunger 1 via the POSITION "A" control levers (each of which controls a brake) in order ti create more or less efficient car braking on the projection of these brakes.
This slowing system is necessary since the initial speed of the car can vary according to the air temperature and humidity (eg. afternoon or evening - fair or rainy weather).

The same plunger 1 can stop the car in the event of an emergency.
It is sufficient, in fact, to use all the available pressure in order to enable the shoes to close completely.

If no type of slowing is required (brake open), it will be possible to use plunger 10 which, acting in contrast to the springs, will completely open the shoes and allow the car to freely pass.

After a certain amount of practice, this speed can be easily adjusted in a very short time (2-3 car passages) and, usually once a day unless there are climatical variations.

SLOWING AND STOP BRAKES IN THE ARRIVAL STATION

(Tab. 12 fig. 3)

Brakes Nos 8-9-10-12 are of this type and are operated by operator "B".

Springs 4 are mounted so as to keep the brake always closed; if operated, plunger 10 overcomes the force of the springs and causes shoes 8 to open, thus enabling the leaf mounted under the car to pass between them.

The arriving car reaches brakes nos 8-9-10 regulated in a gradual way, brake No. 8 which is more open than No. 9 and brake No. 9 which is more open than brake No. 10 will (if perfectly adjusted) stop the car on brake No. 10.
By means of the relative valve, the operator will deliver air to plunger 10 which, by opening the brake shoes, will release the car.
Owing to a slight track slope, this latter will reach brake No. 12 and definitively stop.
Once the passengers have descended, the operator will operate the control to open brake No. 12; this will automatically start geared motor unit No. 5 which will push the car into the parking area.

This type of brake is also equipped with a second plunger controlled by the supplementary safety braking section which opens the brake in case of necessity (see chapter on the "SUPPLEMENTARY SAFETY BRAKING SYSTEM").

SUPPLEMENTARY SAFETY BRAKING SYSTEM
(Tab. 7 fig. 2)

Concerns brakes nos 8-9-10-12.

If the main braking system should remain without air (eg. breakage of a pipe .....) it is equally possible to unblock the car from the arrival brakes in the station thanks to a system similar to the main one, but equipped with a completely independent pipe supplied by a self-contained tank equipped with a CHECK VALVE which prevents the air from returning to the main system.
With this reserve and by operating the relative levers, it is possible to disengage the above mentioned brakes and allow the cars to proceed.

This allows the operation of the second plunger 11 (Tab. 12 fig. 3) which was described in the chapter concerning brakes nos 8-9-10-12 (SLOWING AND STOP BRAKES IN THE ARRIVAL STATION).
On receiving air, this overcomes the force of the springs, opens the brake shoes and enables the car to proceed.

The reserve of the tank pertaining to this system is, however, limited (unblocks 4 – 5 cars); besides not allowing any car to start from the station, it is also absolutely necessary to stop the ascent chain.

INSTRUCTIONS FOR BRAKE USE AND ADJUSTMENT

OPERATOR A (Tab. 6)

First check that the pressure of the air in the small tank is between 6 and 9 atm.
For correct brake operation, the pressure must not fall below 6 atm.

The brake control consists of two parts:
the closing or emergency part (right) and the opening or slowing part (left).
The closing or emergency part is only used when it is necessary to stop a car on a particular brake, marked with the number corresponding to the distributor, or when there is an emergency.
To stop the car on the required brake, just lower the corresponding distributor lever; this will deliver air to the plunger which closes the brake itself.
For the total emergency operation, just lower lever 11; this will automatically close all the brakes in a single movement.
NOTE: When accomplishing the emergency operation, remember to also stop the ascent chain motor.

The opening or slowing part is the most used since when the amusement operates, there will be certain weather conditions (rain, damp, hot, cold, etc.) requiring an intervention to normalize the speed.
Brake No. 4 can be considered as an example.
With the distributor in position D, the brake will be completely open; i.e. there will be air under pressure in the plunger controlling the opening movement (tank pressure).
In this position, the car will freely pass over the brake.
When the distributor is in position E, the brake will be in the slowing position; i.e. the two plungers (for opening and closing) will be without air, but the brake will be kept closed by the springs.
The pressure with which the springs keep the brake closed is set in the S.D.C. workshop during the testing phase.

This setting should only be varied in the event of particular cases or according to the judgement of the installer.
If it should be necessary to increase the slowing power (insufficient spring pressure), lower distributor 12 (Tab. 6) then, using screw 12a of the pressure reducer, adjust the pressure itself to a sufficient value in order to obtain the required slowing (in practice, check this by accomplishing a few trial runs).
With this operation, the air (at the pressure marked on the reducer pressure gauge) passes from the tank to the brake closing plunger via the distributor exhaust which closes the brake itself.
The brake therefore remains closed owing to the pressure of the springs, plus a pressure of the plunger proportional to the factory setting of the pressure gauge.
To relieve additional pressure, lift distributor 12 in order to relieve the brake closing plunger.
Operate in the same way when adjusting brakes Nos 5-6 (lever No. 14 Tab. 6) and brake No. 7 (lever No. 16 Tab. 6).

CHECKS TO BE CARRIED OUT DAILY

CARS

WHEEL CHECK:
Allow the car to pass over the start device (Tab. 9), slightly raise the equalizer (Tab. 20) with a lever and manually turn the now free wheels 36, checking:

- the degree of smooth running (if too "hard" or with too much clearance between taper bearing and pin);
- the clamping of screws 37 which lock the bearings;
- if the plastic (nylon) material used for the wheels is in a perfectly whole condition.

Also check that the safety split pins 40 of nuts 39-43-44 are in a perfect condition.
If necessary, reset the distance between the track and stabilizer wheel 41.
Repeat the same operations for the rear axle.
Check the degree of wear on the safety device 10 (Tab. 15) and the perfect position of tow hook 11 for car ascent.
Check that the wooden beam 9 on which the car-push units act is enbloc with the rest of the chassis.
If the cars travel coupled, check that the connection joint (Tab. 23) is perfectly efficient and the universal joint bolts are accurately clamped.

CAR ASCENT CHAIN

- check the tension
- ascending, check that once the chain starts, all the draft pins are perfectly inserted.

BRAKES

Check:

- that there are no air leaks from the quick couplings.
- that the pipes are in a perfect conditions.

Allowing the car to turn, check that leaf 16 (Tab. 18) enbloc with the car, does not lock on the immediate contact of the brake, but at about 2/3rd of its length (this since the impact of the force of inertia on the public must be as soft as possible).

- the degree of wear of brake lining 9 (Tab. 12);
- every evening at the end of work, completely empty the air tank in order to eliminate any water condensation that the compressor may have accumulated;
- in the morning before starting work, check that the compressor regularly chages and discharges air to and from the system;
- by operating the relative levers, check that the various brakes close on operation;
- by manually operating the "rack" 1 (Tab. 14), check that the automatic brake (11) operates perfectly.

TRACK

- by walking along the track, check the joints between the various track sections and check the bolts are well clamped by using a box wrench;
- check that there are no missing or slackened pins or taper bars, split pins clamping the metal structure or nuts;
- check that the electric cables, current taps and plugs are in a perfect condition;
- check that the level caps of the base are efficient and solid (especially that underneath the two main descents).

LUBRICATION TO BE ACCOMPLISHED DAILY

- In the morning (or before starting the daily work period), it is advisable to facilitate smooth running by using 2 lubricators to spray paraffin or naphtha along the upper part of the track on which the wheels rest.

- The brake closing hoses 3 and 5 (Tab. 12).

CHECKS TO BE ACCOMPLISHED WEEKLY
(and before any holiday)

CARS

Check:

- forecarriage and rearcarriage oscillation, operating in the following way. Set the car on the track section following the parking zone and allow this latter to slide sideways in order to leave the circuit open.
  Slowly back the car until the rear axle is free from the track and capable of all movements.
  Carry out the necessary checks.
  To check the front axle, set the car on the track section preceding that of the parking zone and operate in the same way as that previously described.
- that the bolts connecting the bodywork to the chassis are well clamped.

CAR DRIVING GEARED MOTOR UNITS

- check that these are firmly botlted to the track or to the support structure.

After the first 400 hours work, change the oil in each car-push unit (1-2-5) after having washed the equipment with oil. Successive oil changes should be accomplished after every 4000 work hours.
Check the level after every 2000 hours.
As regards unit No. 4, the first oil change should be effected after 1000 hours following normal washing (allowing it to turn with oil for about 1 minute). Successively, this operation should be repeated according to the temperature that the oil reaches during operation and in the following way:

OIL TEMPERATURE		WORKING HOURS
up to	60°C	8000 - 9000
between	60° - 80°C	4000 - 4500
between	89° - 100°C	2000 - 2500

In any case, it is necessary to change the oil at least once every two years.

TROUBLESHOOTING AND REMEDIES

1) - THE CAR WHEELS FAIL TO RUN SMOOTHLY

A) owing to excessive clamping - remove split pin 40 (Tab. 20 fig. 2), slacken the slotted nut 39 (Tab. 20), unscrew a notch, beat the wheel itself with a plastic hammer checking that the taper bearings are free, then clamp again in the new position using the split pin.

B) owing to excessive grease inlet - remove the lubricator 55 (Tab. 20); using a pipe, let air into the freed hole in order to eliminate the excess grease. Test wheel sliding smoothness by hand.
Repeat the operation until the required degree of sliding smoothness has been achieved.
A few drops of naphtha can help this operation (by dissolving the grease).
If, however, the grease is so excessive that it cannot be eliminated or dissolved, it will be necessary to demount the wheel, to wash the bearings with naphtha and to lubricate again (normally two pump strokes are sufficient).

C) the distance between the "roller" (lower stabilizer wheel) and the track is less than two millimeters - remove split pin 40 (Tab. 20 fig. 2), unscrew slotted nut 43 (Tab. 20), remove wheel 41 (Tab. 20) which, being mounted on an eccentric pin 46 (Tab. 21 fig. 1), can be adjusted over a range of 7 millimeters.
Turn the keyed pin until reaching the exact distance (2 millimeters), clamp and insert the split pin.

2) - THE CAR IS NOT COUPLED TO THE CHAIN

A) the hook is too high as regards the chain - set the car in the station and check that the distance between the lowest point of hook 11 (Tab. 18) and the upper edge of the footboard fixed to the track, is 25 millimeters.

B) the car is too slow in reaching unit No. 3 (car coupling).

- there are not at least 3 persons in the car
- the wheel of car-push unit No. 2 does not sufficiently adhere to wooden beam 9 (Tab. 18); use the wheel adjuster screws.

3) - THE CHAIN IS TOO SLACK OR TOO TAUT

after having unclamped the large nuts at the ends, position the chain-stretching screws on jackstand No. 3, by tightening or slackening according to whether greater or lesser tension is required.
The exact tension reference (other than by visually checking), can be seen at the start of the chain support track: the distance between the wood and the lower part of the chain must be about 120-150 millimeters.

4) - THE BRAKES REMAIN ENGAGED

A) rust in the articulations - clean with naphtha and lubricate.

B) there is insufficient or no grease in pins 7 (Tab. 12) - add grease.

C) the springs are too taut - set bolt 6 (Tab. 13 fig. 3) in order to adjust the tension.

5) - THE STARTING DEVICE AND STARTING GEARED MOTOR FAIL TO OPERATE EFFICIENTLY

A) the microswitch is too far away - check the travel distance.

6) - THERE ARE CARS WHICH FAIL TO REACH THE STATION, REMAINING ALONG THE TRACK

A) insufficient load - (there are not at least 3 persons in the car).

B) the wheels are not sufficiently smooth running - (see point 1 A-B-C).

C) the track is not sufficiently smooth running - lubricate the upper part with paraffin, by leaning out with two lubricators during travel.

7) - THE CARS ARRIVE SLOWLY IN THE STATION

A) insufficient load - (there are not at least 3 persons in the car).

B) excessively closed or badly adjusted brakes - consult the chapter on "INSTRUCTIONS FOR BRAKE USE AND ADJUSTMENT"

C) air supplement engaged - disengage.

D) braking with springs engaged - adjust the pressure via bolt 6 (Tab. 13 fig. 3)

8) - THE CARS REACH THE STATION EXCESSIVELY FAST

A) excessively open or badly adjusted brakes - adjust brakes (consult relative chapter)
engage air supplement
engage spring braking system

9) - CAR WHICH ESCAPES FROM THE STATION ARRIVAL BRAKES FOR ANY REASON

A) immediately open the start device (the cars parked in the station will be able to proceed and thus dampen the impact.

B) clamp the ascent chain.