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MFG: SARTORI IMPORT-EXPORT
S.P.A.
NAME: CRAZY SURF
TYPE: NON-KIDDIE

CRAZY SURF

MOD. RS / 380

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USE AND MAINTENANCE MANUAL BOOK

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1) Introduction

1.1 Guide to the consultation

The use of the "Use and maintenance manual book" is a guide for the operator for a correct operation of the ride. This manual contains all the rules the operator has to follow carefully before, during and after each use of the ride in order to assure his own and riders' safety.

We remind that this manual must always be together with the ride and that the operator is obliged to read it before installation and starting.

If you do not understand some parts of this manual please contact our technicians for any explanation.

1.2 Operation of the ride

The operation of the ride must follow all the rules fixed by our Company, a whatever different use is considered contrary to the primary use.

The ride has to be started only by adult (over 18) operators which also has to know its particular features and the principal safety rules.

We decline all responsibility for any arbitrary modification producing damages to persons and things.

2) Instructions against accidents

2.1 Instructions against accidents during assembling and dismantling

Before beginning with the assembling of the ride the operator/s have to know the following safety rules.

The operator must consider that some dangers are connected with an improper use of the ride, in order to avoid serious dangers for himself and for the public.

Our Company provides the following instructions to be observed :

- Before beginning the assembling make sure that in the set up area there are no high-voltage wires, trees or any other element which can represent a danger for the assembling or working of the attraction.
- During assembling must not be in the working area non authorized persons.
- Assembling and dismantling must be done by qualified personnel.
- Take care to hanging loads and before operate make sure that the load to lift is properly fixed to the equipment.

2.2 Instructions against accidents during operation

As to rules against accidents to be followed during operation, our Company provides the following prescriptions and restrictions :

- The personnel who attends to the ride must be adult (over 18), qualified and must know everything written in this manual.
- Before opening the ride to the visitors the operator will have to let the ride turn empty for some minuts so to check if all safety devices are efficient.

- Check if START-STOP-EMERGENCY devices work properly.
- In no case may the operator leave the ticket booth when the ride is working. If he has to go he will have to be replaced by experienced personnel.
- Before each ride check if all safety fences are properly closed.
- Before each ride make sure that nobody stands or come close to the operational area of the ride.
- Do not load the car if it is unbalanced.
- Do not give the car an excessive speed i.e. higher than allowed.

MAX. ALLOWED SPEED 24 RIDES/MIN., RECOMMENDED 20/22 RIDES/MIN.

To this purpose controls are provided with electronic boards which prevent this. It is absolutely forbidden to modify the electronic boards or to take off eventual seals. Before lowering riders fences, make sure that everybody sits properly in his seat.

NOBODY MUST BE STANDING WHEN FENCES GO DOWN

In case while working a passenger tries to get off the operating ride or others try to go on, stop immediately the ride through the emergency button.

IMPORTANT

The ride has not been planned and therefore is not suitable to younger than 14 year old children and to handicapped persons.

Anyway the operator has to decide what people can go on to the ride.

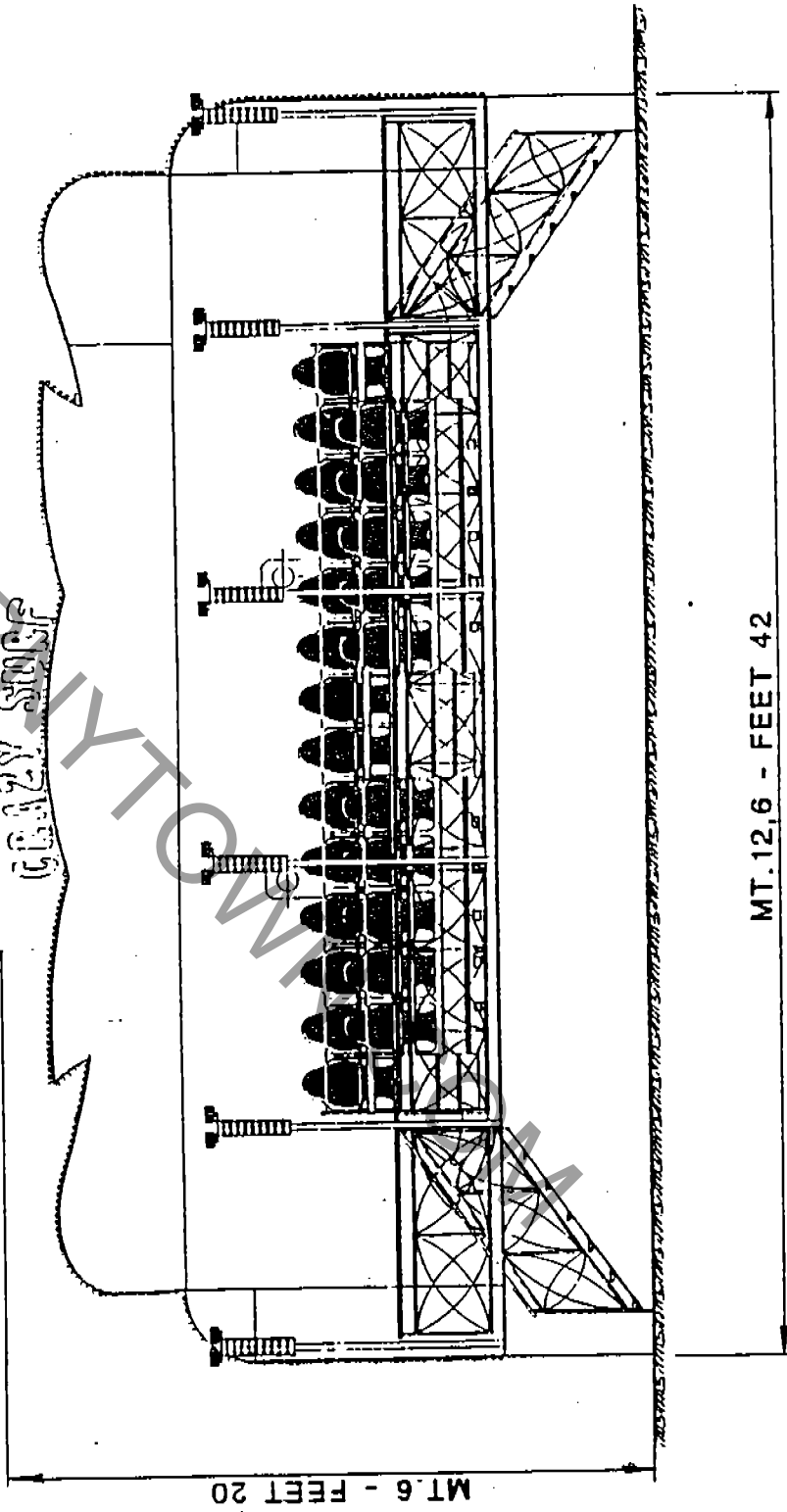
Near these prescriptions the operator must consider the following restrictions for the riders :

- No smoking on the ride
- You have to leave at the cash whatever object which can fall during working. For this purpose expose at the entry a signal of advice.
- Do not let on the ride people in drunkenness or anyway physically altered.

Near the above rules the operator has to follow all those imposed by the country where the ride will operate.

3) General drawing of the ride

MAX. WIDTH IN OPERATION MT.5,6 - FEET 18,6



IN OPERATION MT.6,1 - FEET 20,3

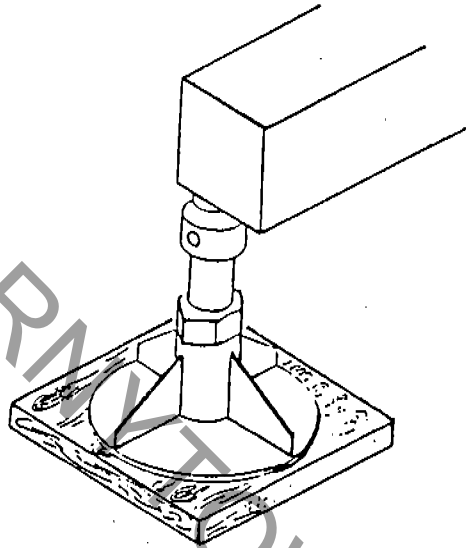
4) Operation of the ride

4.1 Checkings and advices before starting

Before starting some important details must be taken into consideration.

- a) Before each use check the proper leveling with the stabilizers on the trailer.
We remind that each stabilizer must have a 5 cm. wooden piece underneath to easily level the trailer. Such operation is very important for riders safety in order to avoid inconvenient strain which could damage the ride structure.

DURING A DAY CHECK SEVERAL TIMES THE LEVELING OF THE RIDE



- b) Before starting check if the ground mass is connected, do not give power to the board if ground mass is not connected.

The ground mass connection must be done by qualified personnel and follow the rules in force.

- c) We recommend to check before operating all safety and operation buttons. In case a control does not work do not open the ride to public before adjusting it.
- d) Check if all plugs in the electric installation are properly connected.
- e) Check if all safety pins have their safety split pins and are properly connected.
- f) Before opening the ride to public check the connections of the screws of the arms counterbalance, the fixing of the screws between car and arms.
- g) Check the plugs and the split pins of the locks.
- h) Check the efficiency of the braking motor.
- i) Before opening to public let the attraction ride for some minutes to check if all controls work and if there are conditions which could be dangerous to public.

IMPORTANT

FOR PASSENGERS AND RIDE STRUCTURES SAFETY, WE ADVISE TO CHECK EVERY 15 DAYS THE MAINTENANCE OF THE INSIDE ELEMENTS IN EACH CONNECTION BETWEEN CAR AND ARMS, WITH PARTICULAR CARE WHEN CHECKING ALL WELDINGS AND THE INSIDE ANTI-VIBRATION MATERIAL; IN ANY CASE MAKE SURE THAT THERE ARE NO ANOMALIES IN THE STRUCTURE OR OF ANY OTHER ORIGIN. EVENTUAL ANOMALIES SHALL NOT BE IGNORED, CHECK CAREFULLY THE CAUSES FOR SUCH ANOMALIES AND DO NOT LET THE ATTRACTION OPERATE UNTIL THE DANGER IS REMOVED.

EVERY 15/20 DAYS CHECK THE WEAR OF THE SPROCKET BEARINGS AND OF BOTH TRACTION PINIONS, THIS CONNECTION MUST ALWAYS BE GREASED OUTSIDE ON THE SPROCKET AND INSIDE WITH THE PROPER GREASERS.

A GENERAL SAFETY SYSTEM CONSISTS OF FITTING A CHAIN IN THE ROTATION COMPONENTS. THIS CHAIN MUST ALWAYS BE GREASED.

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4.2 Starting

4.2.1 Electric connections

Before starting some checkings are needed.
Check power and if the ground mass is connected.

4.2.2 Start

Once all safety conditions above are verified lift the general switch of moving power and the light switch 220/110V, of field (FIELD) and fan (FAN).

Check now the phases sequence with the red led on the test sequence phases, if it is on, switch off the general switch and the principal power line and then proceed to reverse one phase per time until the light of the led is off.

N.B. Make sure that at each reverse the power is cut off.

Check if all leds of the main converter excluded the led of net POWER are off.

To start the ride act as follows :

- Push RESET (yellow) button and see if the yellow light signal is on, on the control board.
- If it does not switch on check all starting leds.
- Make sure that nobody is in the operational area, check that the speed selector is on zero position and wait that all riders sit properly in their seats.
- Close fences using its button, push BELL button to inform riders of starting, push START button and adjust speed.
- In case of danger the red button EMERGENCY cuts off power in all components of the ride.

4.3 Adjustments and regulations

4.4 Working anomalies

4.4.1 General anomalies

Hereafter are described some inconvenients which may happen to the ride and the relative remedies.

THE ATTRACTION DOES NOT RESPOND TO START CONTROLS

Check on the general board the displays of the sequence phases, in case some alarms (red led) are on, proceed after having cut off the main power supply, to reverse one phase per time untill all alarms are off.

This attraction is provided with some safety systems in order to avoid damages in the mechanic and electronic system. These anomalies are shown in the lighting display on the main converter.

Hereafter are described the possible causes of alarm.

Signal **POWER**
Electronic supply

Signal **ENABLED**
Qualification of the converter

1.Signal **I MAX**

Maximal instant overpower intervention of 110% over the nominal.

The more possible cause for this effect may be the car which has been loaded too much, or the rotation speed has exceeded the maximum allowed limit.

2.Signal **N-MAX**

Maximal overspeed

It is better to remind to the operator to give to the attraction a speed not higher than allowed.

5.Signal **OVER-TEMP**

Check the correct working and direction of the motor fan c.c. and the fuse.

If they are both correct we suggest to ask qualified people to check the motor temperature thermostat. In case of too high environment temperatures, we recommend to keep opened the general board.

6.Signal **FIELD-LOSS**

In order not to cause serious electric damages, the following operations must be done with no power in the ride.

Check the three fuses sequence phase.

Check the correct insertion of the connections of the field excitation boards placed on the upper part of the converter **ANSALDO** and of the terminals **ECC+** and **ECC-** in the terminal box placed on the bottom part of the general board.

If these controls are correct we recommend to proceed as follows :

- Place an ammeter in series between the terminal ECC+ and check the **RANGE OF POWER** which must be of 4A exactly, if they are more or less, turn the trimmer P2 in the field excitation board (SPEED 1A) of the converter ANSALDO.

7.Signal PH-LOSS

Check the net sequence phases and the correct voltage. Furthermore make sure no phases are missing or power fuses have to be replaced.

8.Signal EXT.FAULT

Check the ventilation of the cooling motor and the connections of the pressure switch monostat placed at one side of the cooling motor cc. Moreover check the pressure regulator which must not be less than 6 and the connections of the terminals on the general board.

The lights of the subject do not work.

Check the fuses and the right insertion of the electric connections.

4.4.2 Transmission anomalies

Hereafter are listed some problems which may happen in the transmission and particularly in the motor.

Motor does not start empty

Causes for this problem may be different :

- Coils in short circuit
- Interrupted main field
- Bad contact between brushes and commutator

Possible solutions are : to remake the main field, to repair or rewind the inducted and to check the worn brushes replacing them.

Motor turns release

In this case the coil of the inducted is in short circuit or the commutator plates are in short circuit too. To avoid this inconvenient the only solution is to repair or rewind the inducted or to clean the room between the plates.

Motor does not start coupled

The causes of such inconvenient are mainly :

- Overload
- Machine with brushes out of neutral zone
- Series rewind opposite to the inducted current

Possible solutions are to check the absorbed current and to repute the brushes in the neutral zone.

NOTE : The control of the correct position of the brushes must be done only after dismantling the brush-holder unit and after a careful work of remaking of the commutator (facing).

Closing the rewind switch of the field a tension impulse is given to the armature.

If brushes are in the neutral zone, tension read between both opposite sign brushes is null. At the contrary such position must be reached unscrewing the screws blocking the brush-holder arch to the shield and varying the angle position, reaching the right position.

The voltmeter used should be in central zero position and have two ranges : 0 - 1,5V for the rough setting-up and 0 - 60mV for the refinement.

Brushes must be perfectly suitable to the commutator.

For any other question not mentioned in this manual book, please contact our Company, our technicians will be at your complete disposal.

5) Maintenance

5.1 Periodical maintenance

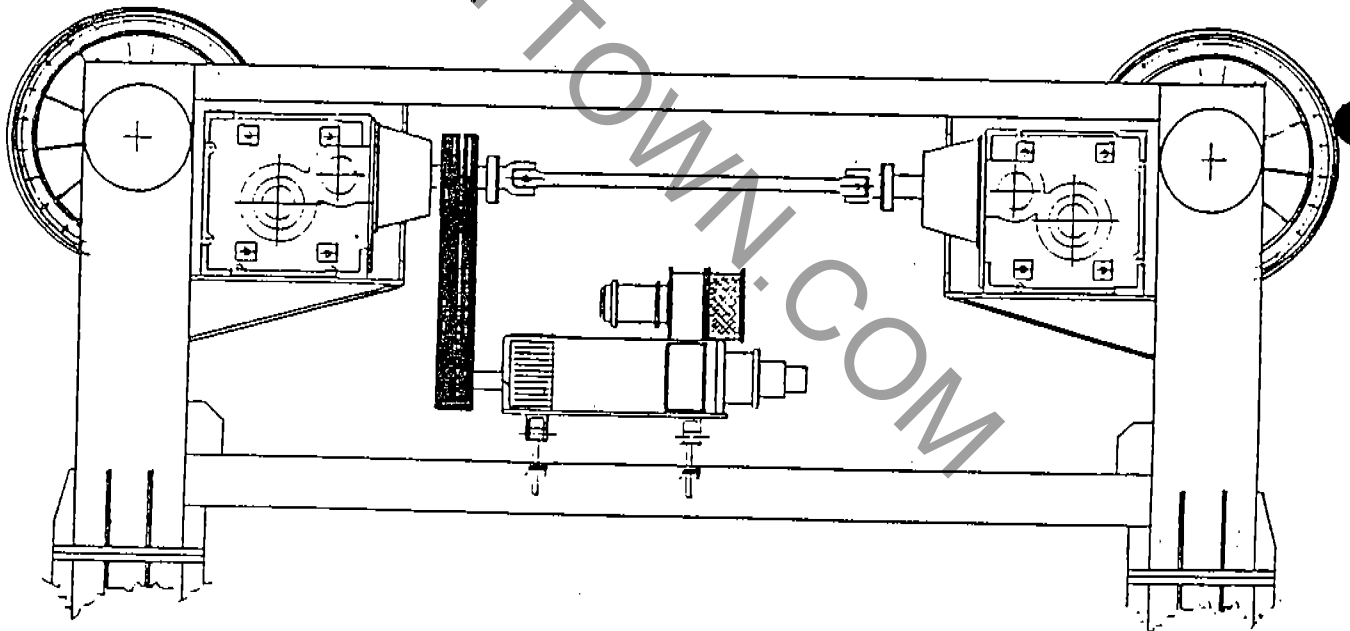
Maintenance of the ride is important to get a proper operation at the lowest costs.
We recommend to follow the hereafter program suitable to a normal use of the ride :

The parts of the ride mentioned in this chapter are :

- Motor
- Reduction gears
- Sprocket bearing
- Pneumatic installation
- Electric installation
- Braking installation
- Car

5.1.1 Transmission

Concerning maintenance of all transmission components, it is advisable to follow the program mentioned hereafter and make sure before beginning any maintenance operation to cut off the power in the control board in order to avoid serious damages to people.



5.1.1.1 Motor

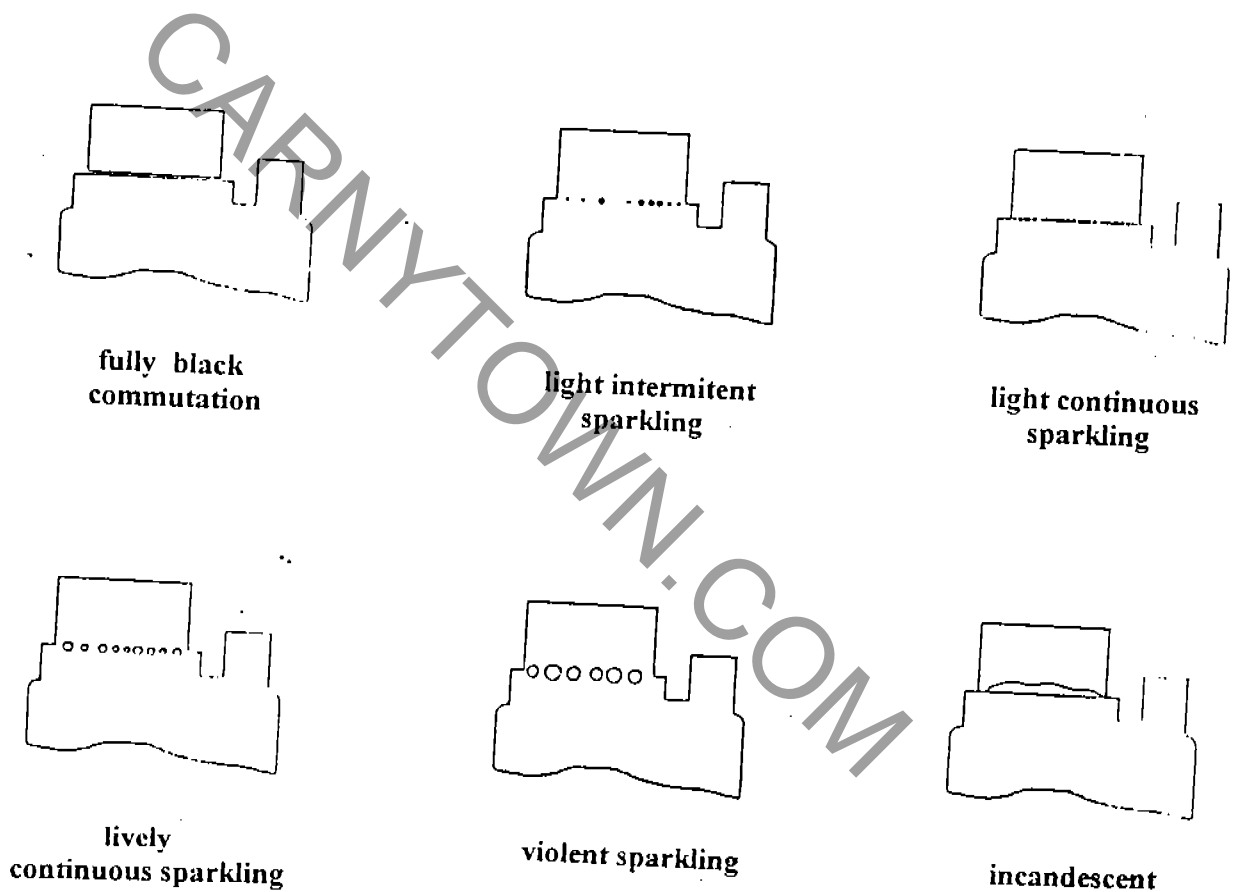
Motor is one of the most important components of the transmission and need a special maintenance program.

We examine now carefully maintenance and control phases for brushes and bearings.

a) Brushes

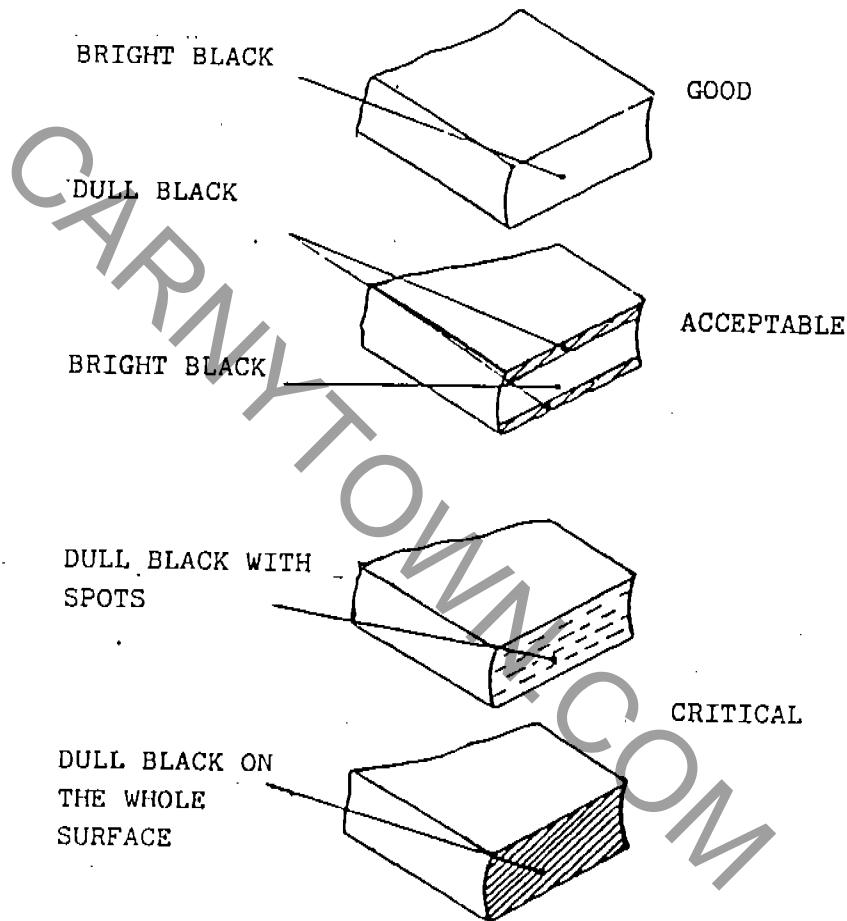
The visual inspection of the commutation is the first step to find out possible malfunctions in the machine and in its power supply system; an immediate evaluation enables to take the proper measures thus preventing abnormal brush wear and commutator scoring.

Usually the commutator adjustment is performed in a testing room, first by supplying the machine with direct current (form factor = 1) and then through a fully controlled three-phase bridge. The degrees of sparking referred to the testing room are listed in the figure.



In particular are accepted the degree 1 (with complete black commutation) for dinamo supply and the degree 1 - 1/4 (slight intermittent sparking) for supply in three-phase fully controlled bridge. Obviously the complete range of working conditions cannot be reproduced in the testing room; for this reason sparking degrees different from those listed can usually be admitted for special and intermittent services (quick current inversions, braking, etc.) but never for continuous use. In case of power supplies different from fully controlled bridge current converters, also control the existence and correct sizing of the leveling impedance coil. A commutation within the above tolerances involves also a regular brush wear as shown in the picture.

BRUSHES WEAR DRAWING



In order to have a regular brushes wear it is necessary that :

a) The load is near the nominal value. In fact a too low load may cause scorings; on the contrary a too high load causes craters and burning on the sliding surface. Besides since the number of brushes is chosen according to the nominal load, if the machine does not operate under these working conditions check the brush wear from time to time : if it is excessive do not hesitate to contact our technicians.

b) Pressure in the spring of the brush must be about 200-250 g/cm². Usually if the machine is subject to vibrations, it requires an increase of pressure.

Check the free sliding of the brushes in their holders (play within 0,1 - 0,3 mm) and check the tightness of the electric connections.

A too low pressure may considerably increase both brush and commutator wear as a consequence of the increased losses on the sliding surface or of sparking.

If pressure is too high, mechanic wear prevails and there is a risk of commutator overheating due to increased friction losses.

If there are several paralleled brushes pressure must be the same for all in order to allow a regular current distribution. If pressure is not regular there is a danger that single brushes are overloaded, with consequent burning of the plaits and burst of the brushes.

b) Bearings

Maintenance of motor bearings is very important.

In this case you have to follow some rules concerning the type of grease to use, quantity and in case of substitution of one or more bearings, the type to use.

We remind that maintenance operations in the motor have to be done with no power.

During greasing operation an excessive quantity of grease must not be injected in the bearing because it could produce an anomalous heating of the bearing.

Greases suitable to be used are:

Shell Alvania 2 and Shell Alvania 3

Esso Beacon 2 and Esso Beacon 3

BP Energrease L52 and BP Energrease L53

Mobilux Grease 2 and Mobilux Grease 3

Lithium based greases with small additions of calcium are strongly recommended as they are water repellent.

In absence of special directions the grease must be changed every 6 months.

The bearings fitted on the motor are indicated in the following table:

Motor Type	SIDE COMMUTATOR						SIDE COUPLING			
		grease		grease	double axle	grease	joint coupling		pulley coupling	grease
160	B3 - B5	g	V1 - V3	g	B3 - B5	g	B3 - B5	V1 - V3	B3 - B5 - V1 - V3	g
	6308 2Z	0	6308 2z	0	6308 2Z	0	NU 312 ECP	NU 312 ECP	NU 312 ECP	25

When bearings need to be changed, be careful not to damage the bearing holder of the shaft.

5.3 Reduction gear

As to reduction gears maintenance the program is as follows :

a) check oil level in the reduction gear.

For this type of reduction gear we recommend to use gear oils with addition EP, minimum viscosity 95 and viscosity expressed following ISO 3448, which varies according to temperature, following data refer to ordinary cases :

Temperature $-20^{\circ}\text{C} +5^{\circ}\text{C}$

class of viscosity VG 100

Temperature $+5^{\circ}\text{C} +40^{\circ}\text{C}$

class of viscosity VG 150

Temperature $+40^{\circ}\text{C} +65^{\circ}\text{C}$

class of viscosity VG 320

In case of big temperature variations, we recommend synthetic lubricants with EP, minimum viscosity 165 and viscosity class VG 150 or VG 220.

Anyway we suggest oils that do not get quickly worn at the respective temperature.

The change of oil in the reduction gear must be done the first time after 50-100 hours operation; subsequently every 2500 hours or at least every 12 months.

Depending on the effective work conditions the above periods can be varied case by case.

It is suggested to check monthly the oil level. In case of more than 10% lack, lubricant must be filled up. Please check if there are oil losses in the unit. It is suggested not to mix different types of oils, also of the same brand or different. In any case do not mix synthetic oils with mineral oils.

5.4 Sprocket bearing

As to sprocket bearing maintenance we recommend to make attention to the greasing of the same in order to avoid any friction, have a proper tight and protect from corrosion. We recommend to grease in order to have grease coming out from bearing and seal rings. In the following table are listed all suggested greases.

ARAL	Aralub HL 2	CHEVRON	Dura-Lith Grease 2
	Aralub LFZ 1		Pinion Grease MS
B.P.	BP Energrease LS2	ESSO	BEACON 2
	BP Energol WRL		SURETT Fluid4K
CASTROL	Castrol Spheerol AP2	GULF	Crown Grease 2
	Castrol Grippa 33S		LUBCOTE 2

Frequency of this operation must be chosen according to working conditions.

In general greasing operation must be done every 50 work hours. We recommend more frequent greasing in tropical countries, high humidity places, dusty places and with strong temperature changes or in case of a continuous rotation.

To compensate settling phenomena it is necessary to check if the blocking of the fixing bolts is in conformity with the standard. This check must be done within the first 100 hours operation and then it is advisable to do it every 300 hours or every 2 months work at least.

In addition to greasing the sprocket bearing, provide for a daily greasing of the external connecting side on the contact point between pinion and sprocket bearing.

5.5 Pneumatic installation

Maintenance of the pneumatic installation is very important for passengers' safety. Hereafter are listed some points to check.

- Before operating check if all fences are properly closed.
- Every week check the wear of the connections and the condition of the pipes.
- If necessary vary air pressure in order to get the optimal adjustment of the fences.

5.6 Electric installation

Maintenance of the electric installation is limited to the periodical control of the electric connections of light plugs and switches, remember that controls, repairing and test operations must be always carried out by qualified people. Non authorized people may not open electric boards and execute works when ride is on power. We recommend to the operator not to modify the electric installation and to change eventual electric pieces with proper material.

5.7 Braking installation

Braking installation does not need particular maintenance operations but only some check in before leaving from a site to another.

Checking operations to be made are :

- a) Check the proper operation of the brakes and of the rear stop lights.
- b) Check the welding of the axles of the trailer.
- c) Check pressure of the tires (max 9 atm.) and the blocking of the wheel nuts.

Please note that considering the wheels are new they need to be checked repeatedly while moving on road. Therefore check nuts on wheel as follows :

- 1° after 20 Km
- 2° after 60 Km
- 3° after 150 Km

and then every time before leaving.

5.8 Car

The parts to be checked on the car are listed hereafter.

We remind that maintenance of the car must be done by qualified personnel :

- Grease periodically all parts of the moving closing systems, such as : levers, pins, blockings, etc.
- Check the proper contact of the electric connection.
- Check the proper operation of all moving pistons and grease the compasses which joint them to the structure of the car.
- Check always the proper blocking of the car to the ride.

5.9 Inspections after using

After using some structural controls must be made in order to verify the perfect resistance of the structure.

To this purpose check all parts subject to rotation : thrust-blocks, car pins, check the operation of riders bars, the blocking of the screws which joint both rear capitals to the façade, the blocking of the screws of counter-weight arm, the efficiency of the structures which joint both parts of the façade; in addition to these controls the operator will have to check all parts on the trailer which are more stressed (i.e. axles, stabilizers).

All checking operations must be done by qualified personnel.

6. Inactivity

6.1 Preparation to stop

Before stopping the ride for a long period a general control of all structures must be made along with a cleaning work of all points subject to intense operation.

Check and clean motor and all its parts with particular care for brushes and air filter.

As to brushes, after checking and cleaning them we recommend to smear a small quantity of graphite-grease and for the air filter it is sufficient to clean it with compressed air.

Remember that these operations and the next must be carried out with no power.

Another component of the ride to be checked and cleaned is the reduction gear; afterwards pinions and sprocket bearings must be checked and greased with much grease in order to avoid corrosions in the material.

Grease all components in the closing system of the car; if there is dirty or encrustations we recommend a careful cleaning and greasing.

These are only some points to be checked before stopping the ride. They are recommended by us in order to get a proper preservation of the structure. Then the customer will have to decide where to make an intervention and in which measure.

6.2 Restarting

Restarting of the ride after a long inactivity period needs a work program directed to check the wear conditions of the components and to replace them if necessary. You have also to check the oil level in the reduction gear, the wear of the pipes in the different installations and the proper working of all controlled elements.

These operations must be made by experienced personnel without leaving any particular.

Once checking operation is over begin with the assembly of the different structures and with the test of the ride. We remind that you must follow all safety rules described in this manual book.

7) Technical notes

7.1 Technical tables

Hereafter are enclosed the tables of the electric installation, the components list and the drawing of the braking installation.

Our Company reserves itself the possibility to vary some components in the installations of the ride without notice.

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7.2 General features

Model	: trailer mounted
Sizes	: operating mt. 12,6 X 5,6 X 6,1 H
Lighting	: KW 12
Moving power	: KW 65
Rotation speed	: max 24 rides/min.
Cars	: n° 1
Places	: n° 24
Hourly capacity	: 800 riders approx.
Cubage	: 1 FLAT 40'
Weight	: 21000 Kg CA.
Transmission	: electromecanic

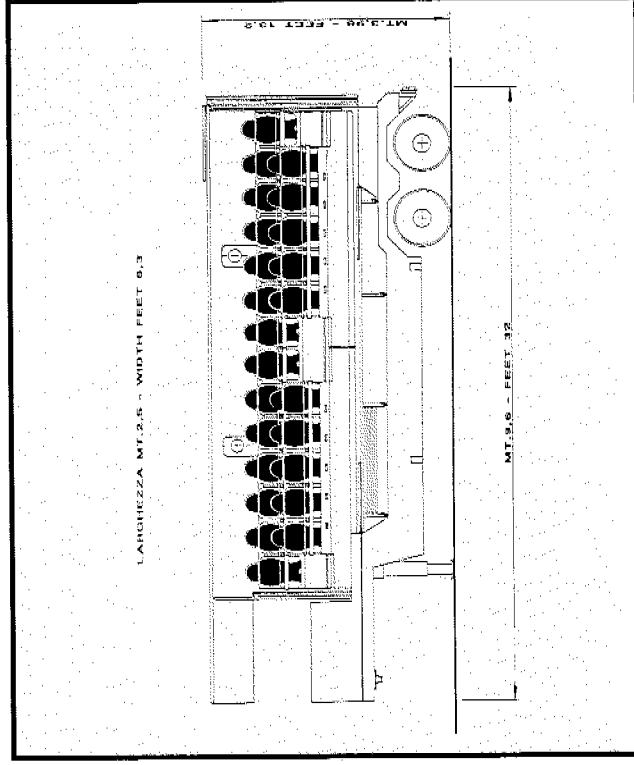
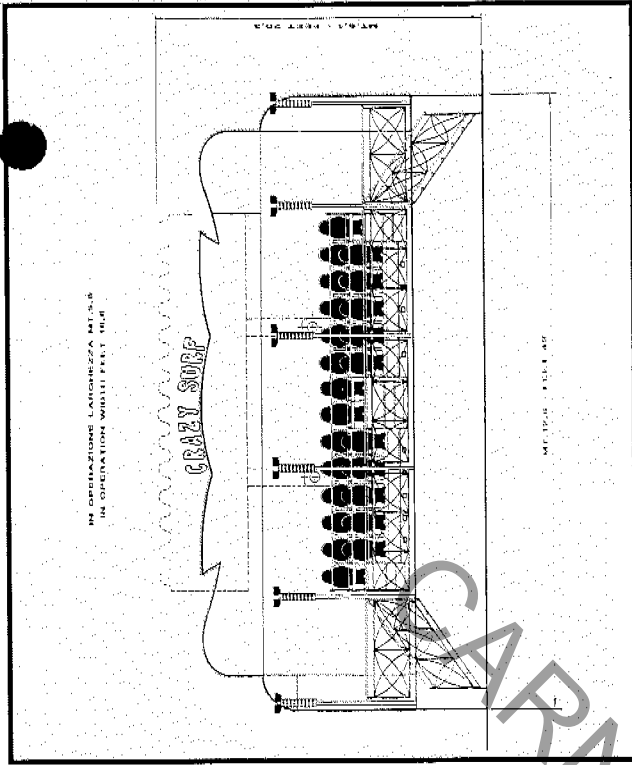
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MOD. RS/380

CARATTERISTICHE GENERALI GENERAL NOTES

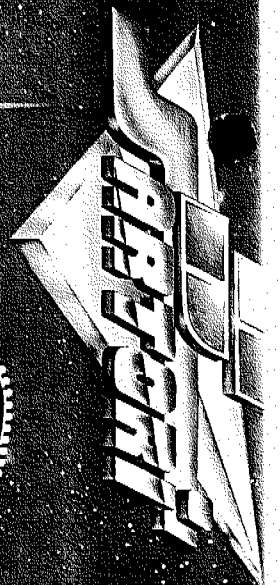
MODELLO MODEL	: MONTATO SU CARRO : TRAILER MOUNTED
DIMENSIONI SIZE	: IN OPERAZIONE MT. 12,6 X 5,6 X 6,1 H : IN OPERATION FEET 42 X 18,6 X 20,3 H
ILLUMINAZIONE LIGHTING	: KW 12 CA. : KW 12 APPROX
FORZA MOTRICE MOVING POWER	: KW 65 : KW 65
VELOCITÀ DI ROTAZIONE ROTATION SPEED	: 24 GIRI AL MINUTO : 24 RPM
VEICOLI VEHICLES	: 1 : 1
POSTI SEATING	: 24 : 24
CAPACITÀ ORARIA HOURLY CAPACITY	: 800 PERSONE CA. : 800 RIDERS APPROX
CUBAGGIO CUBAGE	: 1 FLAT DA 40' : 1 X 40' FLAT
PESO WEIGHT	: KG 19.000 CA. : LBS 42.220 APPROX
TRASMISSIONE TRANSMISSION	: ELETTROMECCANICA : ELECTRIC MOTOR



MANUFACTURERS OF AMUSEMENT RIDES

SARTORI

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