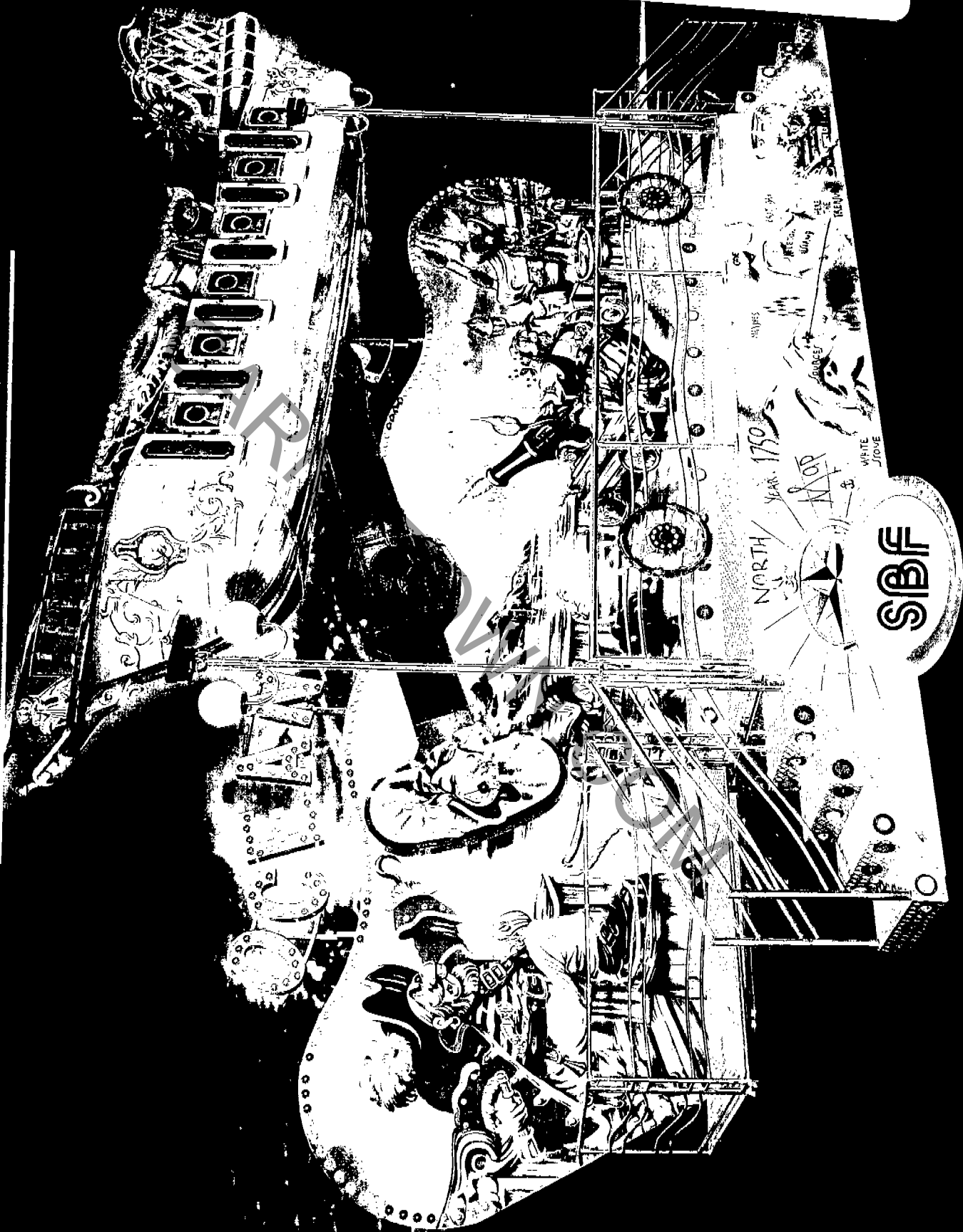
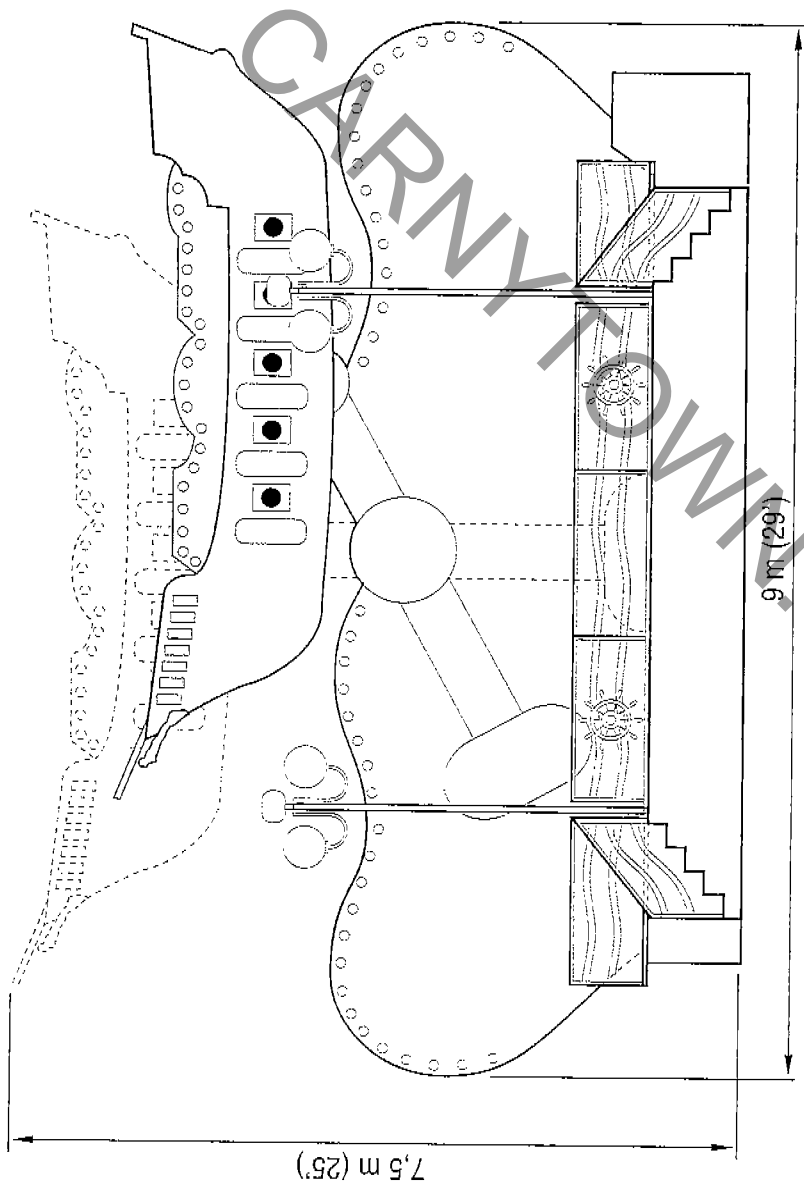


# OCEAN TRIP

MFB: SBF  
RIDE: OCEAN TRIP





**Mod. 191/G OCEAN TRIP**

Dimensioni base - Size base - Dimensions base 9 m x 4 m (29' x 13')

Altezza max. - Max. height - Max hauteur 7,5 m (25')

Posti - Seating - Places 24 bambini o 18 adulti - 24 kiddies or 18 adults - 24 enfants ou 18 adultes

Capacità oraria - Hourly capacity - Capacité horaire 500

Illuminazione - Lighting - Lumière 4 kW - 110/220/240 V - 50/60 Hz

Forza motrice - Motive power - Force motrice 34 kW - 220/380/415 V - 50/60 Hz



S.B.F. s.r.l.  
 Via IV Novembre, 20  
 35040 Casale di Scodosia  
 (Padova) Italy  
 Tel. (39) (429) 847098 (r.a)  
 Fax (39) (429) 878287



# OCEAN TRIP

MOD. 191

OPERATION AND MAINTENANCE



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NAME OF RIDE (Nome Attrazione)		OCEAN TRIP	
SERIAL NUMBER (Numero Serie)		191.062	
MANUFACT. YEAR (Anno Costruzione)		1997	
BASE DIMENSIONS (Dimensioni di base)		9 x 4 mt (29' x 13')	
OPERATING DIAMETER (Diametro di Base)		/	
NR OF CARS (Nr vetture)		01	
NR OF SEATS (Nr posti)		24	
TOT WEIGHT (EMPTY) (Peso tot a vuoto)		14.000 Kg	
TOT WEIGHT (LOADED) (Peso tot a pieno carico)		15.500 Kg	
WEIGHT OF EACH PASSENGER (Peso max passegg.)		1500 Kg	
MOTIVE POWER (Forza motrice)		34 Kw	
LIGHTING (illuminazione)		4 Kw	
OPERATING TEMPERATURE (Temp. Funzionam.)			
VOLTAGE Vortaggio		3 PHASE Trifase <input checked="" type="checkbox"/>	SINGLE PHASE Monofase <input type="checkbox"/>
Hz		50 <input checked="" type="checkbox"/>	60 <input type="checkbox"/>
STANDARDS DIN (Normative DIN) DIN 1055/4112/4114/15018/17100/1886			
INSPECTED (Ispezionato il)		15/10/97	
NAME OF CUSTOMER (Nome cliente)			

ORDER N. (N. ordine)

MBc 67

MAIN COMPONENT LIST: (Lista comp. princ.)

PUMP MOTOR (Motore pompa)

ROTATION MOTOR (Motore rotazione)

404P 4P 380V/50Hz

GEAR BOX (Riduttore)

BREVINI Ec 2065

CONTROL BOARD (Quadro comandi)

REF.

MODEL  
(Modello)

ON TRAILER  
(Su carro)

PARK  
(Parco fisso)

ELECTRONIC CONTROLLER  
(Scheda elettronica)

MODEL.

C 168.95

THIS RIDE HAS BEEN DESIGNED AND CONSTRUCTED FOR PASSENGERS AGE  
(Questa giostra e' stata disegnata e costruita per passeggeri di eta')

6-50

YEARS (Anni)

WHEN ORDERING SPARE PARTS PLS ALWAYS REFER TO OUR ORDER N.  
(Nell'ordinare pezzi di ricambio fare sempre riferimento al ns numero ordine)

NOTE



## VERY IMPORTANT

Because safety rules can be different in different countries, operator of this ride must conform to safety rules in force in the country where this ride is operated and provide at his own cost for all modifications necessary to conform with said local safety rules including but not limited to fencing, gates, operator stand, special wiring, other safety features. This ride has been sold as it is and how inspected by buyer who knows that some changes could be necessary. Any change relating to parts that can effect structural integrity must approved by manufacturer.



### ***3.0 INTRODUCTION***

THIS OPERATION AND MAINTENANCE MANUAL HAS BEEN WRITTEN TO ALLOW OUR CUSTOMERS TO USE THE ATTRACTION IN THE BEST WAY.

**S.B.F. S.R.L. RECOMMENDS TO READ IT VERY CAREFULLY.**

THIS MANUAL HAS SEVERAL SAFETY RULES RELATED TO USE AND MAINTENANCE OF THE RIDE.

THESE RULES ARE OBLIGATORY FOR OWNERS AND OPERATORS OF THE ATTRACTION WHO MUST NOT DISREGARD THEM FOR ANY REASON.

NOTE THAT THESE RULES DO NOT SUBSTITUTE THOSE DISPOSED BY THE PUBLIC AUTHORITIES AND THE DUTY TO USE THE RIDE CAREFULLY AND PROPERLY, EITHER.

S.B.F. S.R.L. IS NOT RESPONSIBLE FOR THE DAMAGES CAUSED BY THE NON-OBSERVANCE OF THESE SAFETY RULES AND IT RESERVES THE RIGHT TO ACT BOTH AGAINST THE OWNER AND THE OPERATOR AND TO NOTIFY THE COMPETENT AUTHORITIES EVERY ABUSE.

### ***4.0 WARNINGS FOR THE MANUAL USE***

BEFORE STARTING ANY OPERATION CONCERNING USE, MAINTENANCE OR ASSEMBLING, READ CAREFULLY THE NOTES HEREAFTER.  
**FOR ANY QUESTION, PLEASE CONTACT US DIRECTLY.**

S.B.F. S.R.L. RESERVES THE RIGHT TO INFORM THEIR CUSTOMERS ABOUT OTHER NECESSARY DETAILS FOR BETTER USE OF THE ATTRACTION.  
SUCH INFORMATION, AS MODIFICATIONS, UPDATINGS, ADDITIONS, MUST BE CONSIDERED AS INTEGRAL PARTS OF THIS MANUAL.

THE CONTENT OF THIS MANUAL BELONGS EXCLUSIVELY TO S.B.F. S.R.L.  
THE TECHNICAL DATA ARE RESERVED TO :  
-CUSTOMERS, OWNERS AND OPERATORS;  
-PERSONNEL IN CHARGE;  
-TECHNICAL INSPECTORS ACTING UNDER PUBLIC AUTHORITY'S ORDER.

ANY OTHER PUBLICATION IS FORBIDDEN, EXCEPT FOR S.B.F. S.R.L. WRITTEN PERMISSION WHICH RESERVES THE RIGHT TO SAFEGUARD ITS INTERESTS AND RIGHTS.



## ***4.1 VISUAL PLATES***

THE ATTRACTION IS DELIVERED WITH METAL PLATES AND SELF-STICKING LABELS REPORTING IMPORTANT INDICATIONS.

- SUCH INDICATIONS DO NOT SUBSTITUTE THE RULES INDICATED IN THIS MANUAL AND CANNOT BE CONSIDERED AS SOLE RULES TO OBSERVE, EITHER. THEY ARE AN IMPORTANT HELP FOR THE CUSTOMERS' BEST USE OF THE RIDE.
- DO NOT REMOVE OR DAMAGE THESE PLATES, BUT KEEP THEM ALWAYS READABLE.

IF THEIR REPLACEMENT IS NECESSARY, METAL PLATES AND SELF-STICKING LABELS SHOULD BE REQUIRED TO S.B.F. S.R.L., INDICATING THEIR CODE NUMBER. SHOULD IT BE NECESSARY ANY UPDATINGS, MODIFICATIONS, ETC., S.B.F. S.R.L. RESERVES THE RIGHT TO INFORM THEIR CUSTOMERS PROPERLY AND TO INTRODUCE SUCH MODIFICATIONS AIMING AT A BETTER USE OF THE RIDE.

## ***4.2 GENERAL RULES CONCERNING THE ATTRACTION USE***

THIS ATTRACTION HAS BEEN PLANNED TO PLEASE THE PUBLIC'S EXPECTATIONS OF AMUSEMENT. FOLLOW THESE FUNDAMENTAL RULES TO OBTAIN THE HIGHEST SAFETY CONDITIONS FOR THE PUBLIC.

- FOLLOW STRICTLY THE INSTRUCTIONS CONTAINED IN THIS MANUAL AND OTHERS THAT S.B.F. S.R.L. RESERVES TO SUPPLY.
  - USE THE ATTRACTION FOR THE PURPOSE IT HAS BEEN PLANNED AND SUBMIT IT TO AN ACCURATE MAINTENANCE.
  - OPERATE ACCORDING TO THE NATIONAL AND LOCAL AUTHORITIES' LAWS AND REGULATIONS.
  - THE PERSONNEL MUST BE COMPETENT AND ACCURATELY TRAINED.
  - IT IS FORBIDDEN TO MAKE ADDITIONS, MODIFICATIONS OR TAMPERINGS.
  - REPARATIONS MUST BE DONE ONLY BY S.B.F. S.R.L. AUTHORISED PERSONNEL AND USING ONLY ORIGINAL SPARE PARTS.
- IF THE RIDE HAS NOT A GOOD AND SAFE OPERATION, THE CUSTOMER MUST STOP IMMEDIATELY THE ATTRACTION, UNTIL THE NECESSARY CONDITIONS FOR A GOOD USE HAVE BEEN ESTABLISHED.



### 4.3 PASSENGERS AND THEIR BEHAVIOUR

THESE DISPOSITIONS, AS ALL THE OTHERS REGARDING THE PASSENGERS INSIDE THIS MANUAL, ARE VALID ALSO FOR THE SERVICE PERSONNEL, WHEN HE OCCUPIES PLACES USUALLY RESERVED TO THE PASSENGERS.

BECAUSE OF THE RIDE CHARACTERISTICS, IT MUST BE FORBIDDEN TO:

- CHILDREN UNDER 4-YEAR-OLD;
- CHILDREN BETWEEN 5-10 YEAR-OLD IF NOT TOGETHER WITH ADULTS;
- CHILDREN BEING VISIBLY UPSET;
- PEOPLE VISIBLY DRUNK OR UNDER THE EFFECT OF DRUGS;
- PREGNANT WOMEN;
- PEOPLE SUFFERING OF HEART DISEASES, BACKBONE DISEASES OR PHYSICALLY UNHEALTHY;
- PEOPLE WITH PHYSICAL HANDICAPS, WHO CANNOT BE SUFFICIENTLY HOLD INSIDE THE SHIP;

ADULTS, BEING WITH CHILDREN BETWEEN 5-10 YEAR-OLD, MUST BE SIT NEAR THEM AND SURVEY THEIR CORRECT BEHAVIOUR.

IT IS FORBIDDEN TO SMOKE AND TO TAKE : ANIMALS, UMBRELLAS, STICKS, BULKY AND SHARPENED OBJECTS;

BEHAVE PROPERLY WITHOUT CAUSING THROGS, LEANING OUT, RAISING UP FROM THE SEATS, ELUDING SAFETY DEVICES, ETC.;

SINCE THE REGULATIONS ARE DIRECTED TO CHILDREN, MESSAGES THROUGH LOUDSPEAKER AND SIGNALS SHOULD BE EASILY UNDERSTANDABLE.

FOR FOREIGN PEOPLE IT SHOULD BE USEFUL TO PUT PLURILANGUAGES SIGNALS.



#### ***4.4 WEATHER CONDITIONS LIMITING THE FUNCTIONING OF THE RIDE***

THE ATTRACTION HAS NOT BEEN PLANNED FOR THE SNOW CHARGE, BECAUSE THE SNOW MUST BE REMOVED.

ATTRACTION MUST NOT OPERATE UNDER THE FOLLOWING WEATHER CONDITIONS:

- RAIN, SNOW, HAIL

- THUNDERSTORM

-WITH WIND SPEED OVER 20m/s

AFTER RAINING AND SNOWING THE GROUND LOADING CAN VARY: CHECK VERY CAREFULLY THE ATTRACTION LEVELLING AND THE CONDITIONS OF THE WOODEN SUPPORTS AFTER THESE PHENOMENA.

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## **4.5 BEFORE OPERATING**

MAKE CAREFULLY THE DAILY CHECKINGS PARTICULARLY WHAT FOLLOWS:

- CHECK THE GENERAL CONDITION OF THE RIDE AND THE PROPER TIGHTENING AND FASTENING OF ALL THE FASTENING AND SUPPORT COMPONENTS;
- CHECK THE PERFECT FASTENING OF ALL COMPONENTS OF THE MOTORIZATION (ENGINE, REDUCER, WHEEL, BRAKING SYSTEM, ETC.) AND OF THE MOVING PARTS (ARMS, PLUGS, ETC.) AND OF THE SHIP (SEATS, SAFETY HANDHOLDS, PLASTICS, FAIRINGS, FLANGING);
- CHECK THE PROPER EARTHING CONNECTION OF THE RIDE;
- CHECK THE EFFICIENCY OF THE DIFFERENT DEVICES OF THE GENERAL SWITCHES USING THE PROPER TEST BUTTON;
- CHECK THE ATTRACTION WHEN IT IS EMPTY, CHECKING ITS FUNCTIONALITY IN ALL CONDITIONS;
- CHECK THE PROPER EMERGENCY STOP OPERATION.

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#### ***4.6 DURING THE OPERATION - SPECIAL NOTES***

KEEP THE COMPLETE CONTROL OF THE ATTRACTION, PAYING PARTICULAR ATTENTION TO THE PASSENGERS' AND PUBLIC'S BEHAVIOUR.

THE PUBLIC MUST BE OUTSIDE THE LOADING AND UNLOADING AREA, AND THIS AREA MUST BE PROPERLY MARKED.

IF THE PUBLIC SHOULD ENTER IT OR BEHAVE DANGEROUSLY, STOP IMMEDIATELY THE ATTRACTION, BEING SURE THAT THIS STOP DOES NOT CAUSE A GREATER DANGER.

IF SOME PASSENGERS SHOULD FEEL SICK OR BEHAVE DANGEROUSLY FOR THEIR OR OTHERS SAFETY, STOP IMMEDIATELY THE ATTRACTION BEING SURE THAT THIS STOP DOES NOT CAUSE A GREATER DANGER.

THE OPERATOR AND THE SERVICE PERSONNEL MUST BE READY TO FACE ANY EMERGENCY SITUATION, KNOWING ALL PROCEDURES AND HAVING AT THEIR DISPOSAL THE NECESSARY MEANS TO GRANT THE PUBLIC'S AND THE PASSENGERS' SAFETY AND A SWIFT AND ORDERED EXIT.

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#### **4.7 PASSENGERS UNLOADING**

- THE PASSENGERS UNLOADING MUST TAKE PLACE IN THE FORESEEN AREA AND WHEN THE ATTRACTION IS ABSOLUTELY STOPPED.
- THE SERVICE PERSONNEL OF THE AREA MUST BE SURE THAT THE PASSENGERS GO OUT QUICKLY; THE, HE WILL INFORM THE OPERATOR THAT THE AREA IS COMPLETELY FREE AND THE PASSENGERS CAN BE LOADED AGAIN.
- THE PASSENGERS CAN DESCEND FROM THE SHIP ONLY WHEN THE SHIP IS COMPLETELY STOPPED.

#### **4.8 LOADING AND UNLOADING PASSENGERS - PARTICULAR WARNINGS**

- THE LOADING AND UNLOADING PASSENGERS MUST HAPPEN IN THE PROPER AREA AND WHEN THE SHIP IS STOPPED AND BRAKED.
- THE PUBLIC MUST STAY OUTSIDE THE LOADING AND UNLOADING AREA AND THE PASSENGERS MUST ENTER THIS AREA IN A SAFE WAY.  
IF TUMULTUOUS THRONG SHOULD FEAR THE PUBLIC RUSH IN THIS AREA, STOP IMMEDIATELY ALL OPERATIONS.
- CHECK THAT THE LOADING AND UNLOADING AREA IS ACCESSIBLE TO THE PASSENGERS ONLY WHEN THE SHIP IS STOPPED AND BRAKED.
- ADVISE THE PASSENGERS PROPERLY, THROUGH LOUDSPEAKERS AND SIGNS, THAT IT IS FORBIDDEN TO LEAN OUT FROM THE SHIP, TO GET UP OR TO BEHAVE DANGEROUSLY.
- CHECK THAT THE PASSENGERS ARE PROPERLY SIT INSIDE THE SHIP THROUGH THE PROPER SAFETY HANDHOLDS, AND THAT THEY ARE PROPERLY CLOSED AND BLOCKED.
- CHECK THAT THE PASSENGERS ARE CORRECTLY ARRANGED IN THE SHIP TO AVOID UNBALANCES AND IRREGULAR MOVEMENTS.



## ***5.0 CONDITIONS OF WARRANTY***

THE WARRANTY CONDITIONS ARE INDICATED IN THE CONTRACT OF PURCHASE, AND THE VALIDITY DEPENDS ON THE COMPLETE OBSERVANCE OF THE PROCEDURES AND WARNINGS STATED IN THIS MANUAL.

ANY TYPE OF WARRANTY OR LIABILITY SHALL BECOME VOID IN THE EVENT OF NON-COMPLIANT USE, OR DAMAGES AS A RESULT OF NEGLIGENCE OR MODIFICATIONS TO THE MACHINE WITHOUT THE WRITTEN AUTHORISATION OF SBF srl.

**CAUTION: UPON DELIVERY TO THE BUYER, MAKE SURE THAT THE ATTRACTION IS IN PERFECT CONDITION AND THAT NONE OF THE PARTS AND/OR UNITS REQUIRED FOR ITS PROPER OPERATION ARE MISSING.**

**N.B. : IN THE EVENT THE ATTRACTION IS SEEN TO BE DAMAGED, OR THERE ARE MISSING PARTS, ADVISE S.B.F.srl IMMEDIATELY.**

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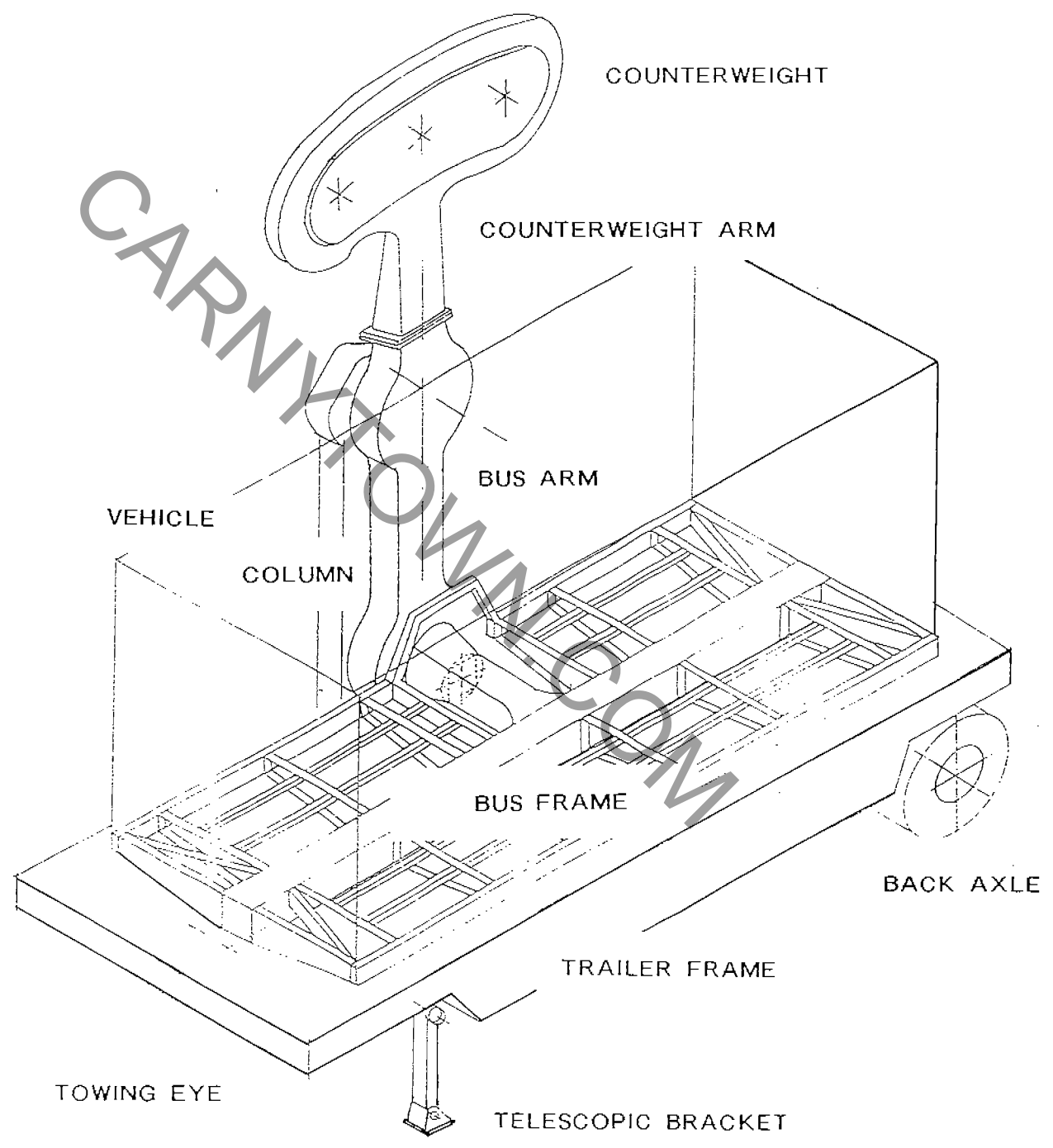
## **6.0 MAIN FEATURES OF THE STRUCTURES**

THIS MANUAL DESCRIBES AN AMUSEMENT RIDE ON TRAILER CALLED "MINI BUS", MADE UP ESSENTIALLY BY FOLLOWING PARTS:

- A TRAILER MADE UP BY A FRAME FIXED TO 2 AXLES.
- A BUS-SHAPED VEHICLE FIXED TO A ROTATING ARM. THE VEHICLE CAN ACCOMODATE 18 ADULTS OR 24 CHILDREN ON 6 ROW OF SEATS.
- A ROTATING ARM, MADE UP BY 1 ARM AND 1 COUNTERWEIGHT, FIXED TO A CENTRAL COLUMN.
- A ROTATION SYSTEM OF THE ARM MADE UP BY 2 PINIONS, 2 REDUCTION GEARS, 2 HYDRAULIC MOTORS AND 1 HYDRAULIC PUMP POWERED BY 1 ELECTRIC MOTOR. THE WHOLE SYSTEM IS MONITORED BY 1 ELECTRONIC CARD.

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# 6.1 GENERAL SCHEME





## **7.0 INSTALLATION**

### **POSITIONING**

THE ATTRACTION MUST BE PLACED ON FLAT, SOLID GROUND, ENSURING THE BASE IS SOLIDLY SUPPORTED.

<!> THE ELECTRICAL CONNECTIONS, CONTROLS AND EMERGENCY PUSH-BUTTON MUST BE EASILY ACCESSIBLE, AND ACCESS TO THEM FREE OF OBSTACLES.

IT'S NECESSARY TO CARRY OUT A LONGITUDINAL AND TRANSVERSAL LEVELLING CHECKING THE LEVELS IN FRONT AND BEHIND OF THE BASEMENT. IF THERE ARE SOME INACCURACY, YOU MUST MANIPULATE ON THE FOOT AND ON THE LEVELLING PISTON.

### **WIRING**

FIRST OF ALL, ENSURE THAT THE LINE VOLTAGE AND FREQUENCY CORRESPOND TO THOSE OF THE ATTRACTION.

IN ADDITION, MAKE SURE THAT THE ELECTRIC POWER SUPPLY IS GREATER THAN THE ATTRACTION'S MAXIMUM POWER ABSORPTION.

THE RIDE MUST BE CONNECTING TO THE EFFICIENT EARTHED.

<!> ONLY SKILLED PERSONNEL SHOULD BE GRANTED ACCESS TO THE PANELBOARD; DISCONNECT THE POWER SUPPLY BEFORE OPENING THE ELECTRICS BOX DOOR.



## 8.0 OPERATION

TO START THE RIDE PROCEED AS FOLLOWS:

- LIFT THE GENERAL SWITCH 21 FIG. 19
- LIFT THE CONTROL SWITCH 22 FIG. 19
- LIFT THE F.M. SWITCH 23 FIG. 19
- LIFT THE HEAT CHANGER SWITCH 24 FIG. 19

- PRESS THE START BUTTON 25 FIG. 20 . THIS OPERATION WILL START THE PUMP CONFIRMED BY THE LIGHTING OF A GAUGE 26 FIG. 20.  
LET THE PUMP OPERATE FOR 10/15 MINUTES SO THAT THE OIL WILL HEAT UP BEFORE STARTING THE RIDE.  
THE IDEAL TEMPERATURE OF THE OIL IS OF 60° C VERIFIABLE ON THE THERMOMETER 27 FIG. 21 APPLIED AT THE HYDRAULIC TANK.

-MAKE MAKE SURE THAT ALL PASSENGERS ARE SIT DOWN AND DULY BLOCKED WITH THE SAFETY HANDLES AND WITH THE GATES OF THE VEHICLE CLOSED.  
TO START THE ROTATION OF THE RIDE IT'S SUFFICIENT TO TURN THE MANIPULATOR 28 FIG. 20 TO STOP IT IN ANY PLACE JUST TURN IT TO 0 IF YOU WANT TO TURN THE RIDE ANTI-CLOCK WISE IT'S SUFFICIENT TO PRESS IT DOWNWARDS.

-TO STOP THE RIDE DURING THE LOADING YOU CAN USE THE BRAKES CONTROLLED BY THE SWITCH 29 FIG. 20 THE USE OF THE BRAKES IS ADVISED BY THE GAUGE 30 FIG. 20 WHILE THE FREE ROTATION IS ADVISED BY THE GAUGE 31 FIG. 20.

-THE USE OF THE BRAKES IS INDISPENSABLE DURING THE OPERATIONS OF OPENING AND CLOSING OF THE ARM.

-ON THE CONTROL PANEL THERE ARE ALSO THE GAUGES OF THE OIL MIN. LEVEL 32 FIG. 20 (THE LIGHTING OF THIS GAUGE INVOLVES THE IMMEDIATE BLOCK OF THE PUMP) AND THE OIL MAX. LEVEL 33 FIG. 20.

-IF THERE IS ANY EMERGENCY, PRESS THE BUTTON 34 FIG. 20 TO START AGAIN THE AMUSEMENT IT'S SUFFICIENT TO TURN THE BUTTON ANTI-CLOCKWISE AND PRESS AGAIN THE START BUTTON 25 FIG. 20.

-AT THE END OF THE RIDE TO RELEASE THE HANDLES, PRESS THE PEDAL 35 FIG. 20

-WHEN YOU CLOSE THE RIDE JUST PRESS THE STOP BUTTON OF THE PUMP 36 FIG. 20 AND DROP THE SWITCHES 21/22/23/24 FIG. 20.

-THE ILLUMINATION IS CONTROLLED BY THE LINE SWITCHES 37 FIG. 19

- *N.B.*

IF THE MANIPULATOR IS NOT ON "0" AND YOU PRESS THE START BUTTON THE PUMP WILL NOT WORK.

-IF YOU HAVE PROBLEMS IN STARTING OR OPERATING THE AMUSEMENT PLS CHECK THE CONTROL FUSES 38 FIG. 19 E 39 FIG. 23 E 40 FIG. 23 THIS CHECK MUST BE DONE IN TOTAL ABSENCE OF ELECTRIC VOLTAGE.



## ***9.0 STEEL STRUCTURE***

ALL STEEL STRUCTURES HAVE BEEN PLANNED, CALCULATED AND BUILT TO CARRY OUT THEIR TASK FOR A LONG TIME AND WITHOUT PROBLEMS, BUT SOME FUNDAMENTAL RULES ARE TO BE OBSERVED AND RESPECTED.

### ***9.1 USE AND MAINTENANCE***

DO NOT DAMAGE THESE STRUCTURES WITH AN IMPROPER USE, SUBMITTING THEM TO NOT EXPECTED LOADS, MAKING WRONG OPERATIONS OF ASSEMBLING, DISMANTLING AND TRANSPORT.

DO NOT CHANGE THE STRUCTURES FUNCTIONALITY, MAKING WELDINGS OF DIFFERENT KINDS, ADDING WELDED ELEMENTS EVEN OF LITTLE DIMENSIONS, MAKING HOLES, EVEN IF LITTLE ONES, STRUCTURAL CUTTINGS AND WHATEVER CAN ENDANGER ITS INTEGRITY.

SUBMIT THE STRUCTURE TO AN ACCURATE MAINTENANCE, AVOIDING THROUGH REGULAR RE-PAINTING THE RUST FORMATION.

BE SURE THAT THERE IS NO BACKWATERS KEEPING ALWAYS SEALED THE OPENINGS, AND FREE FROM OBSTRUCTION THE DRAINING HOLES.

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## 9.2 BREAKINGS

- THE FORMATION OF TINY CRACKS, WHICH UNDER VARIABLE LOADS DURING THE TIME BECOME BIGGER CAUSING SERIOUS DAMAGES, IS A RARE EVENT IF THERE IS A CORRECT PLANNING AND PROPER CONSTRUCTION.

HOWEVER, OPERATIVE CONDITIONS OF THE ATTRACTION, DIFFERENT FROM THOSE EXPECTED, JUST AS OTHER DIFFERENT REASONS, CAN CAUSE BREAKINGS.

- THE PERIODICAL VISUAL CHECK MUST BE EXTREMELY EFFICIENT TO FIND OUT PROBABLE BREAKINGS, TO AVOID THE DESTRUCTION OF THE STRUCTURE.

- CHECK CAREFULLY THE STRUCTURE, PARTICULARLY WHERE THERE ARE WELDINGS, JUNCTURES, LINKINGS, SECTIONS REPLACEMENTS, AND GENERAL DISCONTINUITIES (BEADS, HOLES, ATTACKS, GUSSETS, ETC.); IN THESE PLACES IT IS EASIER THE FORMATION OF CRICKS AND CONSEQUENTLY OF BREAKINGS.

- AN ACCURATE VISUAL CHECK, CARRIED OUT PERIODICALLY AS SUGGESTED IN THE GENERAL CHECKS TABLE, PERMITS TO FIND OUT THE CRICKS OR BREAKINGS BEFORE THE STRUCTURE IS SERIOUSLY AND DEFINITELY COMPROMISED.

BE CAREFUL TO THE PAINT OR GALVANIZING CONDITIONS: A PAINT CLEAVING, ABOVE ALL IF THERE IS ALSO A RUST ESCAPE, GENERALLY MEANS A CLEAVING INTO THE UNDERLYING MATERIAL.

- IF THERE IS ANY PROBLEM IN THE VISUAL CHECK (AND THE SUSPECT OF POSSIBLE CRICKS REMAINS), CONTACT SPECIALISED COMPANIES IN NOT DESTRUCTIVE CONTROLS AND S.B.F. SRL TO MAKE MORE DETAILED CHECKS.

IF THERE ARE CRICKS OR BREAKINGS IN PROGRESS, STOP IMMEDIATELY ALL OPERATIONS AND CONTACT S.B.F. SRL IMMEDIATELY.



### 9.3 CORROSION

- ON OPEN STEEL STRUCTURES A PERIODICAL REPAINT IS AN EFFICACIOUS PREVENTION AGAINST CORROSION.

- MORE DIFFICULT IS THE PREVENTION AND THE CONTROL OF THE CORROSION IN THE CLOSE STRUCTURES (BOX STRUCTURES, TUBULAR ELEMENTS, ETC.) ESPECIALLY IF THE ELEMENTS ARE OF LITTLE THICKNESS.

IN THIS CASE, IT IS POSSIBLE TO CHECK, IN PARTICULAR CONDITIONS, RELEVANT PHENOMENA OF CORROSION, WHICH AFTER SOME YEAR COULD REDUCE THE THICKNESS AND ENDANGER SERIOUSLY THE EXERCISE OF THE STRUCTURE.

IN ALL PARTS OF THE STEEL STRUCTURE SUSCEPTIBLE OF SUCH DANGER, MAKE NO MORE THAN THREE YEARS AFTER ITS CONSTRUCTION, PERIODICAL CONTROLS, EVERY YEAR, OR IF THERE ARE CORROSIVE PHENOMENA, EVERY SIX MONTHS.

SUCH CONTROLS MUST BE EFFECTED BY SPECIALIZED COMPANIES IN NOT DESTRUCTIVE CONTROLS, HAVING THE PERSONNEL AND THE MEANS TO MAKE THICKNESS MEASUREMENTS ON CLOSED STRUCTURES.

PARTICULARLY, SUBMIT TO CHECK THE FOLLOWING PARTS:

- IN THE TUBULAR STRUCTURES, UNDERPUTTING THEM TO A GENERAL CONTROL THAT HAS TO BE PARTICULARLY CAREFUL THAT, FOR THEIR POSITION OR STRUCTURE, PRESENT OFTEN BACKWATERS;

- SHIP'S FRAMES, GENERALLY MADE UP BY A SMALL THICKNESS AND SUBMITTED TO GREAT BACKWATERS; IF THE AREAS TO CHECK ARE COVERED BY FIBREGLASS FOR THE FRAME TIGHTENING TO THE METALLIC STRUCTURE, PROCEED TO A SMALL QUANTITY OF THE FIBREGLASS TO MAKE THE MEASUREMENTS OF THE THICKNESS AND SO, WITH THE HELP OF QUALIFIED PERSONNEL, TO RESTORE THE CONNECTION;

- THE STRUCTURES WHERE IT IS FIXED FRAME ELEMENTS, COVERINGS, DECORATIVE ELEMENTS OR LIGHTINGS;

- THE STRUCTURES CONSTANTLY UNDERGROUNDED OR, HOWEVER, DIFFICULT TO REACH.

IF THERE IS A REDUCTION OF THE THICKNESS MORE OF THE 15% THAN THE INITIAL ONE, STOP IMMEDIATELY ALL OPERATIONS AND CONTACT S.B.F. S.R.L.



## ***10.0 CONNECTION THROUGH BOLTS AND PLUGS***

CONNECTIONS THROUGH DOWELS AND PLUGS FOR RIDES ARE:

- CONNECTIONS WHERE, ONCE THE CONNECTION IS EFFECTED, THERE IS NO RELATIVE MOVEMENT AMONG PARTS;
- CONNECTIONS WHERE THERE IS A RELATIVE OCCASIONAL MOVEMENT;
- CONNECTION WHERE THE RELATIVE MOVEMENT IS FREQUENT.

IN THE LAST TWO CASES, THERE IS THE INTERPOSITION AMONG DOWELS AND PISTON BEARINGS OR ANTI-FRICTION BALL BEARINGS PLACE.

### ***10.1 USE AND MAINTENANCE***

DO NOT DAMAGE SUCH CONNECTIONS UNPROPERLY, SUBMITTING THEM TO UNEXPECTED LOADS, MAKING WRONG OPERATIONS OF ASSEMBLING, DISMANTLING AND TRANSPORT.

AFTER THE CONNECTION FUNCTIONALITY DO NOT MAKE ANY KIND OF WELDINGS, CHANGING OR MAKING INEFFICIENT THE SAFETY MECHANISMS OF CONNECTION, HEATING THE CONNECTION ELEMENTS, MAKING HOLES, STRUCTURAL CUTTINGS OR WHATEVER COULD COMPROMISE ITS INTEGRITY.

SUBMIT THE CONNECTION TO MAINTENANCE, IN ORDER TO AVOID BINDINGS AND CORROSIONS.



## 10.2 CHECKINGS

CHECK ALL PLUGS AND DOWELS CONNECTIONS ACCORDING TO THE PREVIOUS CHAPTERS AND THE GENERAL CHECKS TABLE.

### *WEARING, DEFORMATIONS, CORROSION*

THESE CONNECTIONS, WITH OR WITHOUT RELATIVE MOVEMENTS, ARE USUALLY SUBJECTED TO WEARING AND SELDOM TO DEFORMATIONS AND CORROSIVE PHENOMENA.

WEARINGS, AS FOR THE OTHER MENTIONED PHENOMENA, COULD OCCUR ON THE DOWEL, ON THE HOLES OR ON THE INTERPLACED BEARINGS, AND IF LIMITED WITHIN CERTAIN LIMITS, DO NOT COMPROMISE THE GOOD OPERATION OF CONNECTION.

TO DETERMINE THE MAXIMUM ADMISSIBLE PLAY LEVELS FOR THESE PHENOMENA IS DIFFICULT AND NOT PRACTICAL, FOR THE GREAT NUMBER OF CONNECTION ON THE ATTRACTION.

THIS IS A GENERAL INFORMATION, LEAVING MORE DETAILS ONLY TO CASES CONSIDERED INDISPENSABLE.

USUALLY, THE CONTROL CONNECTION MUST ASSURE THAT:

- THE PLAY AMONG DOWELS AND PLUGS HAS NOT BECOME TOO EXCESSIVE; WHERE THE VALUES OF THE MAXIMUM ADMISSIBLE PLAY ARE NOT INDICATED, IT IS MEANT A PLAY CONSIDERED ANOMALOUS BY COMPETENT PERSONNEL, WHO CONSIDERS WHAT KIND OF CONNECTION, ITS DIMENSIONS AND ITS FUNCTIONING.
- THE DOWEL HAS ALTERATIONS OF FORM OR DIMENSION: OVALISATIONS, UPSETTINGS, STEPS, SEIZINGS, PITTINGS AND OTHER CORROSIVE ATTACKS.
- THE HOLE, OR BEARING, DOES NOT PRESENT ANALOGOUS DEFECTS ON THE INNER SURFACE.

### *CRACKS*

CHECK CAREFULLY THE CONNECTION ELEMENTS (DOWELS), TO DISCOVER PROBABLE BREAKINGS, USUALLY CAUSED BY FATIGUE.

THIS IS A LITTLE DEFECT WHICH CAN BECOME BIGGER DURING THE TIME TILL THE COMPLETE DESTRUCTION OF THE ELEMENT.

THESE FATIGUE CRACKS HAVE GENERALLY THEIR ORIGIN NEAR DISCONTINUITIES SUCH AS DIAMETER CHANGES, SLOTS FOR SEEGER RINGS OR SPLINES, SLOTS FOR MECHANISMS WHICH HAVE TO PREVENT THE ROTATION AND THE ESCAPE OF THE DOWELS AND OTHERS. CHECK THESE PARTS AFTER HAVING TAKEN AWAY FILTHINESS, GREASE.

CHECK VERY CAREFULLY DOWEL, ACCURATELY UNGREASED AND WASHED, IN THE ALREADY MENTIONED ZONES: IF THERE IS ANY DOUBT CONTACT S.B.F. SRL FOR MORE DETAILED CONTROLS.

IF THERE IS ANY DOUBT OF THE GENERAL CONDITION OF DOWELS AND PLUGS CONNECTION, ON WHICH CAN DEPEND THE ATTRACTION SAFETY, STOP IMMEDIATELY ALL OPERATIONS AND CONTACT S.B.F. SRL.



## ***11.0 STEEL NUTS AND BOLTS***

CHECK VERY CAREFULLY ALL SCREW CONNECTIONS, BOTH THOSE MADE IN THE FACTORY AND NOT DISMANTLING (IF NOT FOR MAINTENANCE AND REPARATION) AND THOSE TO RESTORE AT EVERY RIDE ASSEMBLING, BECAUSE THEY ARE EXTREMELY IMPORTANT FOR SAFETY AND RELIABILITY OF THE RIDE.

### ***11.1 RESISTANCE CLASSES***

USUALLY ARE USED COMMERCIAL SCREWS AT HIGH RESISTANCE OF 8.8 AND 10.9 CLASSES (UNI 3740-DIN ISO 898).

SCREWS CLASS NR. 12.9 ARE NOT IN USE, BECAUSE, IN SPITE OF THEIR HIGH RESISTANCE, CAN GET FRAGILE BREAKINGS.  
THE RESISTANCE CLASS OF SCREWS AND NUTS IS EASILY IDENTIFIABLE, BECAUSE MARKED OVER THEIR HEADS.

IN PARTICULAR CASES, SPECIAL SCREWS CAN BE USED, BUILT EXCLUSIVELY FOR S.B.F. S.R.L. IN SMALL STOCK: STAMPING OF RESISTANCE CLASS CAN BE MISSED, BUT IT IS INDICATED IN THIS MANUAL AND NEXT TO SCREWS.

#### **IN REPLACEMENT CASE:**

USE SCREWS AND NUTS OF THE SAME RESISTANCE OF THE ORIGINAL ONES; AS THERE IS NO CORRESPONDENCE BETWEEN THE RESISTANCE CLASS DIN OR UNI AND THAT OF OTHER RULES (SAE, ASTM, ETC.), IT IS ABSOLUTELY FORBIDDEN TO USE DIFFERENT NUTS AND BOLTS THAN THOSE INDICATED;

USE CLASS OF RESISTANCE NUTS COMPATIBLE TO THE SCREWS CLASS OF RESISTANCE (TO WHICH ARE COUPLED );

ORDER THE SPECIAL SCREWS DIRECTLY TO S.B.F. SRL;

WHEN EXPECTED, USE ONLY INSERTS FOR NUTS AND BOLTS OF HIGH RESISTANCE (UNI 5714-DIN 6916).



## 11.2 TIGHTENING

THE PROPER SCREWS TIGHTENING IS FUNDAMENTAL FOR A SAFE OPERATION OF THE CONNECTION.

A STRONG TIGHTENING (EXTRA-TIGHTENING) CAN PRODUCE PERMANENT PLASTIC DEFORMATIONS COMPROMISING THE CONNECTIONS TOUGHNESS.

ON THE OTHER HAND, A LOOSE TIGHTENING (UNDER-TIGHTENING) CAN PRODUCE:

- ❶ SUBSIDENCES FOR FATIGUE;
- ❷ LOOSENINGS;
- ❸ SLIPPINGS OFF OF CONNECTED PARTS AND BOLT CUTTING.

FOR A CORRECT SCREW TIGHTENING OR FOR A PERIODIC CHECK, USE EXCLUSIVELY A DYNAMOMETRIC KEY OF PROPER DIMENSIONS, AFTER HAVING CAREFULLY READ INSTRUCTIONS FOR USE INCLUDED WITH THE SAME KEY.

TURN THE NUT FOR A CORRECT BOLTS TIGHTENING.

IN THE FOLLOWING TABLE ARE LISTED THE VALUES OF THE TIGHTENING MOMENTS FOR WIDE PITCH EXTERNAL THREADS ISO TYPE UNI 5931- DIN 912, UNI 5737- DIN 931, UNI 5739- DIN 933.

THESE VALUES ARE TAKEN BY THE MOST TRUSTWORTHY LITERATURE AND THEY ARE VALID FOR CONNECTION EFFECTED IN THE FACTORY NOT SUBMITTED TO REPEATED ASSEMBLINGS AND DISMANTLINGS.

IF THERE ARE CONNECTIONS SUBMITTED TO REPEATED ASSEMBLINGS AND DISMANTLINGS, IN ORDER NOT TO DAMAGE THE SCREWS, IT IS ADVISABLE TO APPLY A TIGHTENING MOMENT REDUCED OF 10%.

<i>FREQUENT DISMANTLINGS</i>	<i>ASSEMBLINGS</i>	<i>AND</i>	<i>SELDOM DISMANTLINGS</i>	<i>ASSEMBLINGS</i>	<i>AND</i>
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CLASS ⇒	8.8	10.9	CLASS ⇒	8.8	10.9
THREAD ↓	NM	NM	THREAD ↓	NM	NM
M8	22	32	M8	25	35
M10	44	62	M10	48	69
M12	76	110	M12	84	120
M14	120	170	M14	130	190
M16	220	315	M16	245	350
M18	265	380	M18	295	420
M20	380	540	M20	420	600
M22	565	810	M22	630	900
M24	690	990	M24	770	1100
M27	1040	1490	M27	1160	1650
M30	1390	1980	M30	1540	2200
M33	1730	2480	M33	1930	2750
M36	2390	3420	M36	2660	3800



TAKE CARE OF NOT PAINTED PARTS AND EXPOSED TO ATMOSPHERIC PHENOMENA (ES. DOWELS, PLUGS, SCREWS, ETC.) USING ONE OF THE FOLLOWING PROTECTIVE GREASES:

<i>TYPE</i>	<i>BRAND</i>
AGIP	GR PV2
MACH-BP	GP 2
CHEVRON	CUP GR 2
ESSO	ESTAN 2
FINA	MERKAN 2
GULF	CST 2
MOBIL	MOBIL GREASE A.AN.2.
SHELL	UNEDO GR 2

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## **12.0 TRANSMISSION MAINTENANCE**

### **12.1 REDUCTION GEAR**

-THE OIL CHANGE MUST BE DONE THE FIRST TIME AFTER 50/100 OPERATING HOURS AND THEN EVERY 2500 OPERATING HOURS OR AT LEAST ONCE A YEAR.

-DURING THE CHANGE IT'S ADVISABLE AN INSIDE WASH WITH RECOMMENDED LIQUID.

-TO PREVENT THE DEPOSITS OF DIRT, IT'S ADVISABLE TO REPLACE THE OIL WHEN REDUCTION GEAR IS HOT. IT'S ADVISABLE A MONTHLY CHECK THE OIL LEVEL.

-AVOID MIXING DIFFERENT TYPES OF OIL. FOR THE OIL CHOICE USE ONLY RECOMMENDED OIL AS PER ATTACHED SCHEDULE.

### **12.2 INTERNAL ARM TRANSMISSION BEARINGS**

GREASE THE INTERNAL ARM TRANSMISSION BEARING OF ROTATION BY MEANS OF PROPER GREASING UNITS EVERY 15 DAYS.

-THE FIRST IS SITUATED NEAR THE ROTATION CENTRE OF THE ARM 1 FIG.1

-THE SECOND IS SITUATED NEAR THE ROTATION CENTRE OF THE VEHICLE ON THE BACK OF THE ARM 2 FIG.2

N.B. WE ADVISE TO USE ONLY BEARING GREASE SKF LGEP 2/1.

### **12.3 BASE-BEARINGS**

THE FREQUENCY OF THE LUBRICATION MUST BE CHOSEN IN FUNCTION OF THE OPERATING CONDITIONS. NORMALLY THE GREASING MUST BE DONE EVERY 100 HOURS OF OPERATION.

### **12.4 UPPER TOOTHED BASE-BEARING**

-GREASE THE TRACKS OF THE ROLLING SPHERES BY MEANS OF THE LUBRICATORS 3 FIG.3 WITH THE GREASES ADVISED IN THE "A" LIST OF SCHEDULE NR.2°.

-GREASE EVERY 15 DAYS, THE TOOTHING 4 FIG.3 WITH A BRUSH WITH GREASES ADVISED IN THE "B" LIST OF SCHEDULE NR.2°

### **12.5 LOWER BASE-BEARING**

-GREASE EVERY 15 DAYS THE TRACKS OF THE ROLLING SPHERES BY MEANS OF THE LUBRICATORS 5 FIG.4 AND 6 FIG.5, AFTER HAVING REMOVED THE CARTERS INSIDE AND UNDER THE VEHICLES.

### **12.6 WAGON-REVOLVING FRAME BASE-BEARINGS**

-GREASE EVERY 2 MOUNTHS THE TRACKS OF THE ROLLING SPHERES BY MEANS OF THE LUBRICATORS 9 FIG.8

USE ONLY GREASES RECOMMENDED IN THE "B" LIST OF SCHEDULE NR.2°



## 12.7 BEVEL GEAR

FOR THE FIRST OPERATING MONTH GREASE AND CHECK EVERYDAY THE CONIC COUPLES (BEVEL GEAR) PRESENT IN THE ROTATION ARM OF THE TRANSMISSION THEN GREASE WEEKLY. THE GREASING MUST BE DONE WITH A BRUSH AND ONLY WITH GREASE SEE TABLE N° 4. TO HAVE ACCESS TO THE LOWER CONIC COUPLE (BEVEL GEAR) 10 FIG. 9 IT'S NECESSARY TO REMOVE THE CARTER 11 FIG. 10. TO HAVE ACCESS TO THE UPPER CONIC COUPLE (BEVEL GEAR) IT'S SUFFICIENT TO THE PROPER HOLE PLACED ON THE COLUMN, AS PER PHOTO FIG. 12.

## 12.8 HYDRAULIC CIRCUIT

### 1) FILTERS

REPLACE THE FILTERS 13 FIG. 13 OF THE HYDRAULIC TANK PLACED UNDER THE BASE OR UNDER THE TRAILER AFTER 50 OPERATING HOURS FOR THE FIRST TIME. BEFORE REPLACING THE FILTER IT'S NECESSARY TO CLOSE THE SHUTTERS 14 FIG. 13 BOTH PLACED BEFORE EACH FILTER.

N.B.

BE SURE TO RE-OPEN THE SHUTTER AFTER REPLACEMENT OF FILTERS. JUST 15 SECONDS OF OPERATION WITHOUT OIL WILL BREAK THE PUMP.

### 2) HYDRAULIC OIL

IN NORMAL CONDITIONS THE OIL MUST BE CHANGED AS FOLLOWS:

- FIRST TIME AFTER 1000 OPERATING HOURS.
- THEN EVERY 2000 OPERATING HOURS.

CHECK EVERYDAY THE LEVEL OF THE OIL IN THE TANK.

FOR THE OIL CHOICE LOOK AT TABLE Nr 3.

AVOID MIXING DIFFERENT TYPES OF OIL.

THE OIL FILLING MUST BE DONE THROUGH THE CAP 15 FIG. 14 OF THE HYDRAULIC TANK ACCESSIBLE FROM THE TRAPDOOR OF THE WAGON PLATFORM.

THE DRAINING IS DONE THROUGH THE CAP 16 FIG. 15.

## 12.9 HANDLES

WEEKLY GREASE THE RACK 17 FIG. 16 OF THE HANDLES WITH COMMON GREASE.

## 12.10 ELECTRIC SYSTEM

CONTROL

CHECK EVERYDAY THE PROPER OPERATION OF THE BOTTONS "START" E "EMERGENCY" AND SPEED ADJUSTER

ELECTRIC BRUSH

VERIFY WEEKLY THE STATE OF EROSION OF THE ELECTRIC BRUSHES 18 FIG. 17 PLACED IN THE CENTER OF ROTATION ARM AND IN THE ROTATION CENTER OF THE VEHICLE.

IF NECESSARY TO REPLACEMENT, IT'S NECESSARY TO REMOVE THE COVERS 19 FIG.2 AND 20 FIG.18.