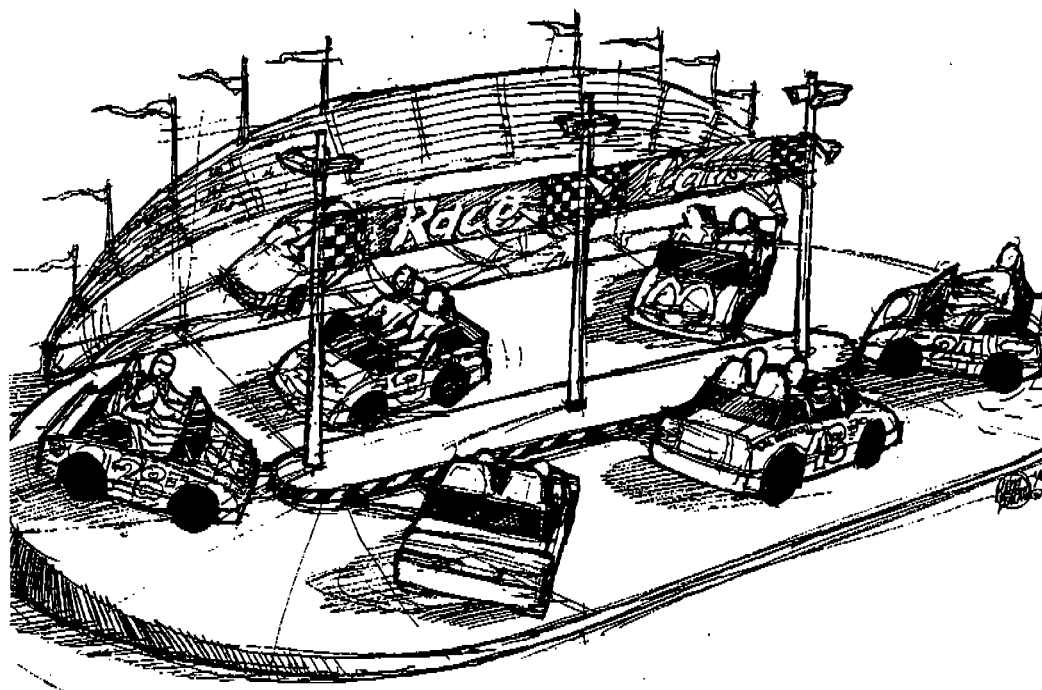


Mighty Blue Grass
ZAMP

MFG: ZAMPERLA, INC.
NAME: SPEEDWAY
TYPE: KIDDIE

AMUSEMENT RIDES MANUFACTURERS

05317

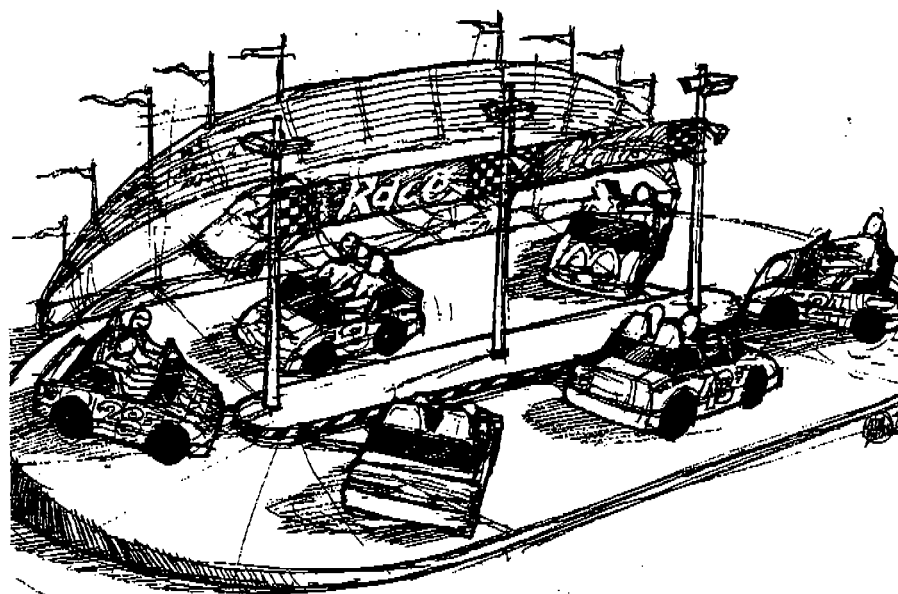


SPEEDWAY

INSTRUCTION FOR SETTING UP-MAINTENANCE
ISTRUZIONI PER L'ASSEMBLAGGIO-MANUTENZIONE

SPARE PARTS CATALOGUE
CATALOGO RICAMBI

SPEEDWAY



SEATS

Maximum total number of passengers
Maximum total passengers weight
Loading

16
1000 Kg
All seats simultaneously

PERFORMANCE

Direction of travel
Ride speed
Ride duration (maximum)
Ride duration (recommended)
Hour capacity
Operator

Counterclockwise
4.5 rpm
2,5 min. (timer)
2 min (timer)
600
1

DRIVE

Electric

INSTALLED POWER

Total
Drive
Light

12 Kw
5 Kw
7 Kw

The descriptions and illustrations contained in the present publication are understood to be nonbinding; ZAMPERLA thus reserves the right to effect, at any time and without prior commitment to bring the publication up-to-date, any such alterations to organs, component parts any accessory supplied as it may deem opportune for the purposes of improvement or in order to meet any demand of a constructional or commercial nature.

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FOREWORD

On all ZAPPERLA production, the plate with technical data is affixed on the control board's side. It reports the ride, the serial number, the capacity and the electric characteristics. Information has been prepared in this manual to assist operator to understand, maintain and operate the ride, within the limits shown on the data plate.

Before installation or starting the ride for the first time, this manual should be studied carefully to obtain a clear knowledge of the unit and the duties to be performed.

Take pride in your ride-keep it clean and in good mechanical and electrical condition.

The information and instructions contained in the manual do not cover all details or variations in the equipment, nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should additional information be desired or should particularly problems arise which are not sufficiently covered in this document, please contact your nearest sales and service office.

SPARE PARTS

This manual is made in order to give a quick and easy spare parts identification.

To improve both identification and forwarding we would suggest to follow these easy rules at the order time:

1. Ride name (see on the data plate or from the setting-up, maintenance and spare parts manual)
2. Serial number (see on the data plate or from the setting-up, maintenance and spare parts manual)
3. Part number description (see spare parts manual)
4. Number of pieces requested.

PREFAZIONE

Su tutti i modelli ZAMPERLA, la targhetta con i dati tecnici è situata sul fianco del cassone del quadro elettrico.

Essa riporta il nome della giostra, il numero di serie, la capacità e le caratteristiche elettriche. Quanto scritto nel presente manuale ha lo scopo di fornire all'operatore informazioni chiare sul funzionamento e manutenzione della-giostra, nei limiti operativi indicati sulla targhetta.

Leggere attentamente il presente manuale prima della installazione e del primo avviamento della giostra, in modo da avere una buona conoscenza dell'attrazione e delle operazioni da espletare. Abbiate cura della vostra giostra, mantenetela pulita e in buone condizioni sia meccaniche che elettriche.

Le informazioni e le istruzioni contenute in questo manuale non trattano tutti i dettagli e le variazioni opzionali dell'attrazione, ne prevedono tutte le possibili eventualità che si possono riscontrare durante l'installazione, il funzionamento o la manutenzione della giostra.

Se desiderate ulteriori informazioni o se si verificano situazioni particolari che non sono sufficientemente trattate in questo manuale, vi preghiamo di contattare il nostro punto di assistenza più vicino.

PARTI DI RICAMBIO

Questo manuale è preparato in modo da rendere rapida e sicura l'identificazione delle eventuali parti di ricambio.

Per velocizzare sia l'identificazione che la spedizione Vi preghiamo di seguire queste semplici regole all'atto dell'ordine:

1. Nome della giostra (rilevabile dalla targhetta identificazione oppure dal manuale di uso e manutenzione e ricambi)
2. Numero di serie (rilevabile dalla targhetta di identificazione oppure dal manuale di uso e manutenzione e ricambi)
3. Nr. di codice e descrizione pezzo (rilevabile dal manuale ricambi)
4. Nr. di pezzi richiesti.

Balloon Race

BR12F033TW91

92453678

nr.1

Nome giostra
Ride name

Numero di serie
Serial number

Nr. pezzi
Part Q.ty

Nr. codice
Part number

ZAMPERLA

ZAMPERLA

USEFUL INFORMATIONS INFORMAZIONI UTILI

INTRODUCTION

This User and Maintenance manual has been prepared to insure that Owners and Operators use the amusement ride properly and correctly.

Zamperla s.p.a. therefore, heartily recommended that this manual be careful and thoroughly read.

This manual also indicates numerous safety regulations relating to the use and maintenance of the ride. These regulations are obligatory for the Owners and Operators of the ride and shall never be disregarded.

It is hereby understood that manual regulations shall not substitute for the categorical regulation laid down by Public Authorities. Nor shall they substitute for the Owner's or Operator's duty to run the ride with utmost prudence and care.

Zamperla s.p.a. shall therefore not be held responsible for any damage due to failure to observe the safety regulations outlined herein and reserves the right both to take any and legal action against the Owner or Operator and to inform the appropriate authorities of each and every such nonobservance.

NOTICE ON THE USE OF THIS MANUAL

Before beginning any installation, operating or maintenance task on the ride, read carefully all the regulations in this manual and the others supplied. If you have doubts or any problems with interpreting the meaning, ask Zamperla s.p.a. for clarification. Zamperla s.p.a. reserves the right to pass on to their Customers at any time all information they deem necessary for better and safer operation of the ride. Above said information, under form of modifications, updates or additions shall be for all practical purposes an integral part of this manual.

GENERAL REGULATIONS FOR THE USE OF THE RIDE

The ride described in this ride manual has been designed and fabricated to satisfy the desire for amusement and thrills in the best way possible for the public for whom it is destined as will be better specified later in this manual.

In order to achieve this result under conditions of public safety, the Owner and Operator shall observe the following fundamental rules and shall do so in a competent and professional fashion.

...Scrupulously observe all the instructions given in this manual and also any and all other regulations Zamperla s.p.a. reserves the right to furnish.

INTRODUZIONE

Questo manuale di Uso e Manutenzione è stato scritto affinché i Proprietari e gli Esercenti della attrazione in oggetto la possano utilizzare nel migliore dei modi.

La Zamperla s.p.a. ne raccomanda quindi vivamente una scrupolosa lettura.

Il presente manuale contiene inoltre numerose norme di sicurezza collegate all'uso e alla manutenzione dell'attrazione.

Tali norme sono obbligatorie per i Proprietari e gli Esercenti dell'attrazione, i quali non potranno per alcun motivo disattenderele.

Resta inteso che tali norme non si sostituiscono a quelle imperative disposte dalle Pubbliche Autorità, ne fanno venire meno il dovere di esercitare l'attrazione con la massima prudenza ed attenzione.

La Zamperla s.p.a. non risponderà quindi dei danni derivanti dal mancato rispetto delle presenti norme di sicurezza e si riserva sia di agire in via di rivalsa contro il Proprietario e l'Esercente sia di segnalare alle competenti Autorità ogni caso di mancato rispetto.

AVVERTENZE DI UTILIZZO DEL MANUALE

Prima di iniziare qualsiasi operazione di montaggio, uso o manutenzione, leggere attentamente le prescrizioni contenute nella presente pubblicazione e nelle altre fornite in dotazione.

In caso di dubbio o difficoltà interpretative, chiedere chiarimenti alla Zamperla s.p.a.

La Zamperla s.p.a. si riserva il diritto di comunicare in qualsiasi momento alla propria rispettabile Clientela tutte le informazioni che essa ritiene necessarie per un migliore e più sicuro utilizzo della attrazione.

Tali informazioni, sotto la forma di modifiche, aggiornamenti o aggiunte, vanno considerate a tutti gli effetti come parti integranti di questo manuale.

NORME GENERALI DI UTILIZZO DELL'ATTRAZIONE

L'attrazione descritta nella presente pubblicazione è stata progettata e costruita per soddisfare nel migliore dei modi le aspettative di emozione e divertimento del pubblico al quale è destinata, così come viene meglio specificato nel seguito.

Affinchè tale risultato possa essere conseguito in condizioni di sicurezza per il pubblico, il Proprietario e l'Esercente dovranno, in modo competente e professionale, attenersi alle seguenti regole fondamentali.

...Attendersi scrupolosamente alle istruzioni contenute nel presente Manuale, così come a tutte le altre istruzioni che la Zamperla s.p.a. si riserva di fornire.

...Use the ride for the purpose for which it was built and provide with a thorough maintenance programme for it.

...Operate the ride in full compliance with all laws, prescriptions, and regulation issued by local and national Authorities.

...Employ only qualified and accurately trained Personnel.

...Do not subject the ride in anyway whatsoever to modifications, additions or tampering.

...Have all repairs carried out by personnel authorized by Zamperla s.p.a. and use only original spares.

...If at any moment or for any reason you even suspect that the ride cannot be used correctly and safety, the Owner and Operator shall shut down the ride until safe operating conditions have been re-established.

PASSENGERS AND THEIR BEHAVIOUR

These regulations, as with all those dealing with passengers in this manual, are equally good for the Operating Personnel when they occupy positions normally set aside for passenger use.

Given the specific nature of the ride, the following persons should not be allowed to get on:

- children under 8 years of age
- children between 8 and 10 year of age not accompanied by an adult;
- person who are obviously drunk or under the influence of drugs;
- pregnant women;
- person who suffer from heart disease, spine affections, or in precarious health conditions;
- persons with handicaps such that their safety cannot be guaranteed sufficiently by the safety lap bar.

Passengers shall not smoke on the ride, carry pets, umbrellas, walking sticks, bulky or sharp-pointed articles or anything which could become a dangerous bruising instrument.

Passengers shall always behave in such a way as not to put their own safety or that of others at risk, e.g. by forming crowds, leaning out of the ride, standing up, tampering with the safety devices etc.

Service Personnel shall make sure that these regulations are observed also by displaying appropriate and clearly visible notices.

In the ride is being used by ethnic minorities or by large numbers of tourists so that it could be presumed that there will be passengers unable to read the language used on the notices, it is heartily recommended that multi-language notice be used.

...Utilizzare l'attrazione per lo scopo per cui è stata costruita e sottoporla ad accurata manutenzione.

...Operare secondo le leggi, i regolamenti e le prescrizioni delle Autorità locali e nazionali.

...Utilizzare personale competente ed accuratamente addestrato.

...Non sottoporre nel modo più assoluto l'attrazione a modifiche, aggiunte o manomissioni.

...Fare eseguire le riparazioni da personale autorizzato dal Zamperla s.p.a. e non utilizzare parti di ricambio non originali.

...Se, in ogni momento e per qualsiasi motivo, si avesse anche il semplice sospetto che l'attrazione non potesse essere utilizzata in modo corretto e sicuro, il Proprietario e l'Esercente dovranno fermare l'attrazione fino al ristabilimento delle condizioni necessarie al suo buon funzionamento.

PASSEGERI E LORO COMPORTAMENTO

Le presenti disposizioni, così come tutte le altre riguardanti i Passeggeri contenute nel manuale, si intendono valide anche per il Personale di Servizio, quando questo per qualsiasi motivo occupi posizioni normalmente destinate ai passeggeri.

Date le caratteristiche dell'attrazione, si deve vietare la salita a:

- bambini di età inferiore a 8 anni;
- bambini di età compresa fra 8 e 10 anni se non accompagnati da adulti;
- persone visibilmente ubriache o sotto l'effetto di stupefacenti;
- donne incinte;
- persone sofferenti di malattie cardiache, di affezioni alla colonna vertebrale o fisicamente non integre;
- persone portatrici di handicap fisici per cui non possano essere assicurate sufficientemente dai maniglioni di sicurezza.

I passeggeri non possono fumare sull'attrazione, portare animali, ombrelli, bastoni, oggetti ingombranti e appuntiti o che in ogni caso possano diventare corpi contundenti.

I passeggeri devono avere in ogni caso un comportamento da non mettere in pericolo la propria e l'altrui incolumità, per esempio creando assembramenti, sporgendosi, alzandosi dai sedili, eludendo i dispositivi di sicurezza, etc.

Tali prescrizioni devono essere fatte rispettare dal Personale di Servizio anche mediante apposita segnaletica chiaramente visibile. Quando, per la presenza di minoranze etniche o di flussi turistici, è presumibile vi siano Passeggeri non in grado di comprendere la lingua nazionale, si raccomanda vivamente l'utilizzo di segnaletica plurilingua.

LIMITING WEATHER CONDITION

The ride should not be used in the following weather conditions:

- rain, snow or hail;
- storms with danger of lightening;
- wind at speeds over 20 m/s, i.e. force 8 on the Beaufort Scale (it blows leafy branches off trees). Rain or snow can change the load carrying capacity of the ground.

Therefore we recommend monitoring the ride levelling device and the status of the wooden support.

BEFORE STARTING TO RUN THE RIDE

Scrupulously carry out the daily checks scheduled in the inspection general chart. In particular check what is described as follows.

- Check the levelling of the ride and the condition of the supports.

Any setting must be immediately corrected with adequate measures.

- Check the correct tightening of jackstands and tracks, making sure that all cotter pins are in place.
- Check to make sure the safety lap bars system of cars is working properly.
- Check to make sure the ride is working properly either under semiautomatic or manual cycle.
- Check to make sure the Emergency device is working properly.

CONDIZIONI ATMOSFERICHE LIMITANTI IL FUNZIONAMENTO

L'attrazione non deve funzionare quando si verificano le seguenti condizioni atmosferiche:

- pioggia, neve o grandine
- temporale con pericolo di fulmini
- vento con velocità superiore a 20m/s, corrispondente a forza 8 secondo Beaufort (si staccano fronde dagli alberi).

A causa di precipitazioni atmosferiche può variare la portanza del terreno: dopo piogge o nevicate si raccomanda di tenere particolarmente controllato il livellamento dell'attrazione e lo stato degli appoggi.

PRIMA DI INIZARE IL FUNZIONAMENTO

Esegui scrupolosamente le verifiche giornaliere previste dalla tabella generale delle verifiche ed in particolare quanto di seguito indicato.

- Verificare il perfetto livellamento e lo stato degli appoggi. Un eventuale cedimento deve essere immediatamente corretto con accorgimenti immediati.
- Verificare il corretto fissaggio delle cavallette e dei binari e la presenza di tutte le copiglie se previste.
- Verificare il corretto funzionamento dei maniglioni di sicurezza delle vetture.
- Verificare il corretto funzionamento sia in semiautomatico che in automatico dell'attrazione.
- Verificare il corretto funzionamento dei pulsanti di emergenza.

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PAGINA BIANCA

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THE FOLLOWING IS A LIST OF GENERAL GUIDELINES FOR THE OPERATOR SELECTION AND INSTRUCTION

- 1) Select skilled and trained operators, capable of understanding the function, use and control of amusement rides.
- 2) Instruct each operator in the correct use and function of the ride he has to supervise. The supervision has to include:
 - a) Tests and procedures for normal and emergency operations.
 - b) Manufacturer's recommended maximum speed and load.
 - c) Manufacturer's recommended time cycle ride time and frequency of operation.
- 3) Ask each operator to inspect the ride he has to supervise, each day.
 - a) Check that no parts of the ride are damaged, omitted, or worn so as to be unsafe.
 - b) Report all the irregularities to the Superintendent or owner.
 - c) Do not operate the ride if any irregularity is found until such condition is corrected.
- 4) Instruct the operator to allow no passenger on the ride who is visibly ill, or under the influence of drugs or alcohol.
- 5) Instruct the operators and the attendants on the proper methods of securing passengers in the ride. Do not allow passengers in the ride if they cannot be properly secured because of their size or size of malfunction of the safety device.
 - a) Stop the ride immediately if any passenger is observed tampering with any restraining device or behaving dangerously, such as standing up.
- 6) Advise the operator against starting or operating the ride when a person (passenger, spectator, or employee) is in an endangered or unsafe position in the ride or within the ride area.
- 7) Insist that each operator remains in full control during the operation of the ride so as to pay full attention to the ride and to its passengers.
- 8) Instruct the operator to allow no other person, other than another trained operator, to operate the ride, except parts of the ride that are designed to be controlled by the passenger.
- 9) Advise the operator that factory-installed safety devices cannot be tampered with or removed.
- 10) Instruct the operators and the attendants that passengers are required to secure all personal belongings such as keys, coins, glasses, etc. which may become loose while riding.

CONSIGLI GENERALI PER LA SELEZIONE E L'ISTRUZIONE DELL'OPERATORE

- 1) Selezionare operatori di una certa maturità e competenza, in grado di capire tutte le funzioni e l'uso delle attrazioni e il loro controllo.
- 2) Istruire ogni operatore nella maniera più completa sull'uso appropriato e sulla funzionalità della giostra, la sua supervisione includerà:
 - a) Controlli e procedure per operazioni normali e di emergenza.
 - b) Massima velocità e carico raccomandate dal costruttore.
 - c) Tempi dei cicli e frequenza degli stessi raccomandati dal costruttore.
- 3) Richiedete all'operatore di ispezionare la giostra controllando ogni giorno:
 - a) Che tutte le parti della giostra siano integre in maniera da garantire un funzionamento in completa sicurezza.
 - b) Segnalare ogni irregolarità al sovrintendente o al proprietario.
 - c) Non operare con la giostra in malfunzionamento, riattivare la funzione solo a riparazione avvenuta.
- 4) Istruire l'operatore a non far salire in giostra persone visibilmente ammalate o sotto l'influenza di alcool o droga.
- 5) Istruire l'operatore e gli aiutanti sugli appropriati sistemi di sicurezza della giostra. Non permettere ai passeggeri di salire in giostra se non possono essere assicurati ai dispositivi di sicurezza a causa della loro mole e del malfunzionamento dei dispositivi stessi.
 - a) Fermare la giostra immediatamente se qualche passeggero tiene comportamenti pericolosi quali agitare oggetti non consentiti o alzarsi in piedi durante il funzionamento.
- 6) Istruire l'operatore di non fare partire il ciclo di funzionamento mentre qualche persona (passeggero, spettatore o dipendente) è in posizione pericolosa all'interno della giostra o comunque nell'area di operazione.
- 7) Assicurarsi che l'operatore rimanga al suo posto durante il ciclo di funzionamento in maniera da avere la situazione sempre sotto controllo.
- 8) Assicurarsi che l'operatore non permetta ad altri di eseguire le operazioni di sicurezza di sua competenza.
- 9) Assicuratevi che l'operatore verifichi che i sistemi di sicurezza forniti dal costruttore non vengano manomessi o rimossi.
- 10) Istruite gli operatori e gli aiutanti che richiedano ai passeggeri di assicurare oggetti personali quali occhiali, chiavi, monete ecc. che possono cadere durante il ciclo di funzionamento.

PREVENTIVE MAINTENANCE SAFETY

The following is a list of a few general selected rules which should be followed by everybody. Remember that in the long run the key to a Safe and Successful Operation is to have well-trained and well-supervised operators.

GENERAL SAFETY GUIDELINES

- 1) All work must be done by competent, skilled mechanics capable of understanding the function of the parts and their proper installation.
- 2) Inspect the ride, each day before the operation in order to determine that no part is damaged, omitted or worn so as to be unsafe, or to develop into an unsafe condition.
- 3) Perform all the manufacturer's recommended maintenance procedures at intervals and as specified in the operation and maintenance manual, in the following general areas:
 - a) Lubrication
 - b) Pneumatic, Hydraulic and Electrical System
 - c) Torquing of Bolts
 - d) Wear of Bolted or Pinned Joints
 - e) Adjustment and Care of the Mechanical Components such as Brakes, Clutches, and Air Compressors
 - f) Passenger Safety Devices
 - g) Crowd Control Devices
 - h) Operating and Emergency Controls
 - i) Factory Installed Safety Devices
- 4) Study each job carefully to determine all hazards so that all the necessary safeguards can be taken.
- 5) Examine all the safety devices, tools, ladders, etc., before they are used so as to be sure they are in good condition. Ladders should be clean and unpainted.
- 6) Use the proper tool or equipment for each job. Before each job, turn off the electric power.
- 7) Wear close-fitting comfortable clothing when working on or close to a mechanical apparatus or live electrical circuit. Avoid finger rings, jewellery or other objects which may be caught in moving parts or come in contact with electrical circuits.
- 8) Protect your eyes by wearing approved Safety Glasses or Goggles.
- 9) Always wear hard hats. When working in elevated areas, use a safety belt.
- 10) When the work to be performed is hazardous, two men should work together.
- 11) If guards are removed from equipment, make sure they are replaced when the job has been carried out.
- 12) Clean up the area after each job.
- 13) Keep a record of the parts replaced and date of replacement. Inform the manufacturer of any frequent replacements which may be the cause of unsafe conditions.
- 14) Make all the modifications or additions as

MANUTENZIONE PREVENTIVA SICUREZZA

Questa lista con poche regole generali dovrebbe essere seguita da tutti.

ORIENTAMENTI GENERALI DI SICUREZZA

- 1) Tutto il lavoro deve essere svolto da meccanici competenti e qualificati, atti a capire la funzione dei dispositivi e la loro installazione.
- 2) Ispezionare la giostra ogni giorno prima del funzionamento, per constatare che nessuna parte sia danneggiata, trascurata o consumata in maniera da risultare non sicura, o da far sì che si creino condizioni di insicurezza.
- 3) Eseguire le procedure di manutenzione raccomandate dal costruttore a intervalli e in maniera specificata dal manuale di funzionamento e di manutenzione, nelle seguenti aree generali:
 - a) Lubrificazione
 - b) Sistema Pneumatico, Idraulico ed Elettrico.
 - c) Coppia di serraggio dei bulloni.
 - d) Usura dei Bulloni o dei Perni.
 - e) Regolazione e cura dei componenti meccanici quali freni, frizioni e compressori d'aria.
 - f) Dispositivi per la sicurezza dei passeggeri.
 - g) Dispositivi per il controllo delle persone.
 - h) Controlli operativi e di emergenza.
 - i) Dispositivi di controllo installati dalla fabbrica.
- 4) Studiare ogni compito accuratamente per definire tutti i rischi così da poter prendere le necessarie protezioni.
- 5) Prima di usare i dispositivi di emergenza, attrezzi, scale, ecc., esaminarli accuratamente in modo da essere sicuri che siano in buone condizioni. Le scale devono essere pulite non verniciate.
- 6) Usare l'appropriato oggetto o equipaggiamento per ogni lavoro. Staccare l'energia elettrica prima di qualsiasi lavoro.
- 7) Indossare calzoni comodi ma aderenti quando si lavora o si è vicini ad un apparato meccanico od elettrico. Evitare catenine, anelli, gioielli o altro che possa impigliarsi durante il movimento o venire a contatto con circuiti elettrici.
- 8) Proteggete gli occhi con occhiali di sicurezza o maschere.
- 9) Indossare sempre il casco: quando si lavora ad una certa altezza usare la cintura di sicurezza.
- 10) Quando il lavoro da eseguire è pericoloso, bisogna che almeno due persone lavorino assieme.
- 11) Se vengono rimosse delle protezioni per eseguire un lavoro, assicurarsi che queste vengano rimesse al proprio posto a lavoro eseguito.
- 12) Pulire l'area di lavoro dopo ogni intervento.
- 13) Aggiornare il diario di manutenzione ogni volta si fa un intervento indicando le parti sostituite. Informare il costruttore di ogni sostituzione frequente che può essere causa di condizioni di pericolo.
- 14) Fare le sostituzioni o le aggiunte come indicato nel manuale di servizio.

outlined in the manufacturers service and safety bulletins.

PREVENTIVE MAINTENANCE

Preventive maintenance is the best assurance for a successful operation.

The ride operator should clean and inspect the ride daily. Lubrication should be performed at recommended intervals.

MAINTENANCE-FIRST TWO WEEKS OF OPERATION

The ride has been completely serviced and tested before leaving the factory.

However, during the first two weeks of operation, the ride operator should be especially careful and watch for possible hydraulic leaks (air, oil).

During the first two weeks, all bolts and nuts should be checked daily for tightness. After the first two weeks, they should be checked at least monthly.

MANUTENZIONE PREVENTIVA

Una manutenzione preventiva è la migliore garanzia per una operazione di successo.

L'operatore dovrebbe ispezionare e pulire la giostra giornalmente. Eseguire la lubrificazione come da intervalli raccomandati.

MANUTENZIONE PRIME DUE SETTIMANE DI OPERAZIONE

La giostra viene completamente collaudata e controllata prima di lasciare la fabbrica, comunque durante le prime 2 settimane di operazione, l'addetto alla giostra deve essere attento alle eventuali perdite (aria, olio). Controllare il corretto serraggio di tutti i bulloni. Successivamente effettuare un controllo mensile.

ZAMPERLA

TROUBLESHOOTING PROCEDURE

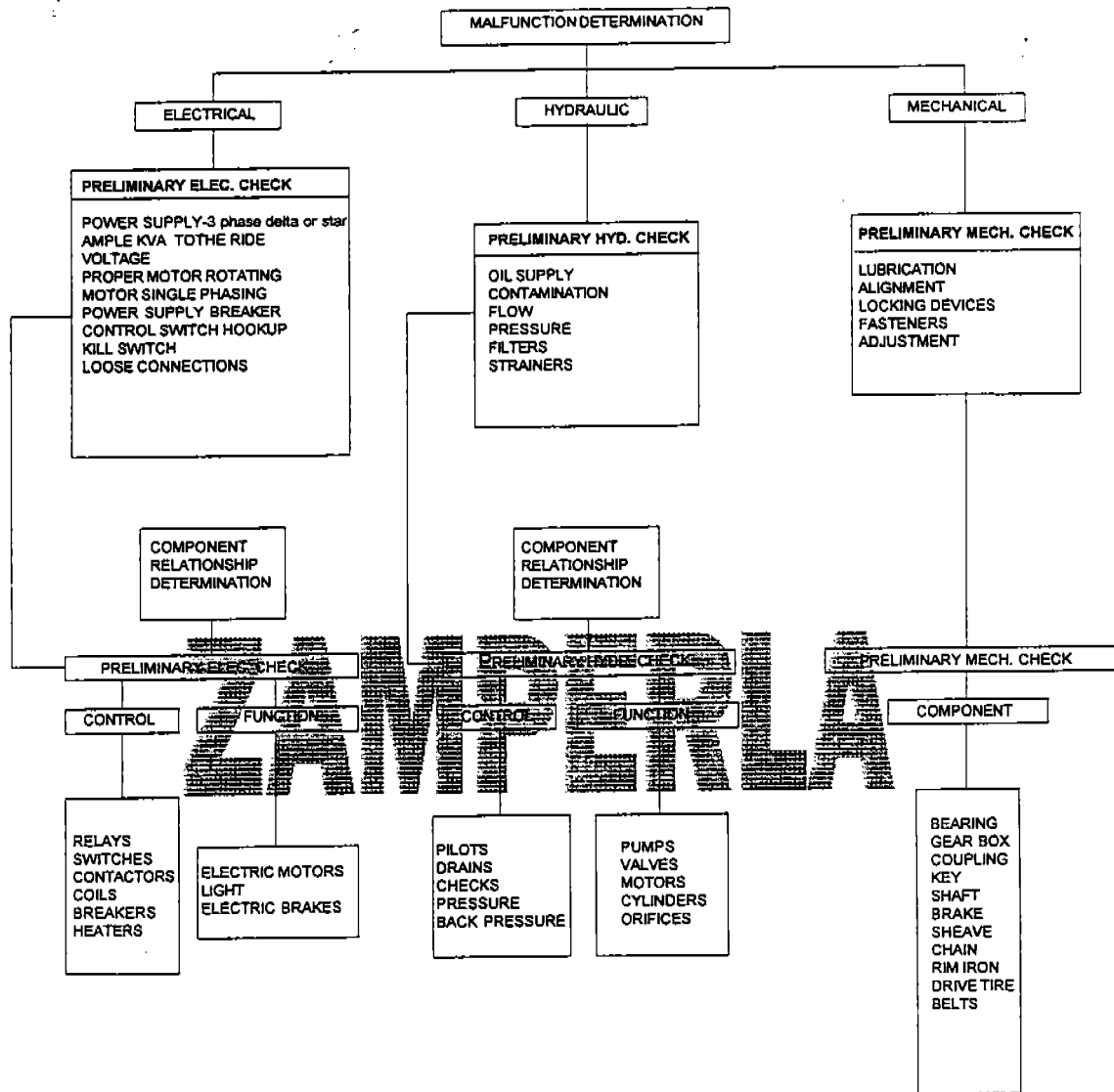
Before calling the factory for help on a ride having problems, certain things should be done ahead of time.

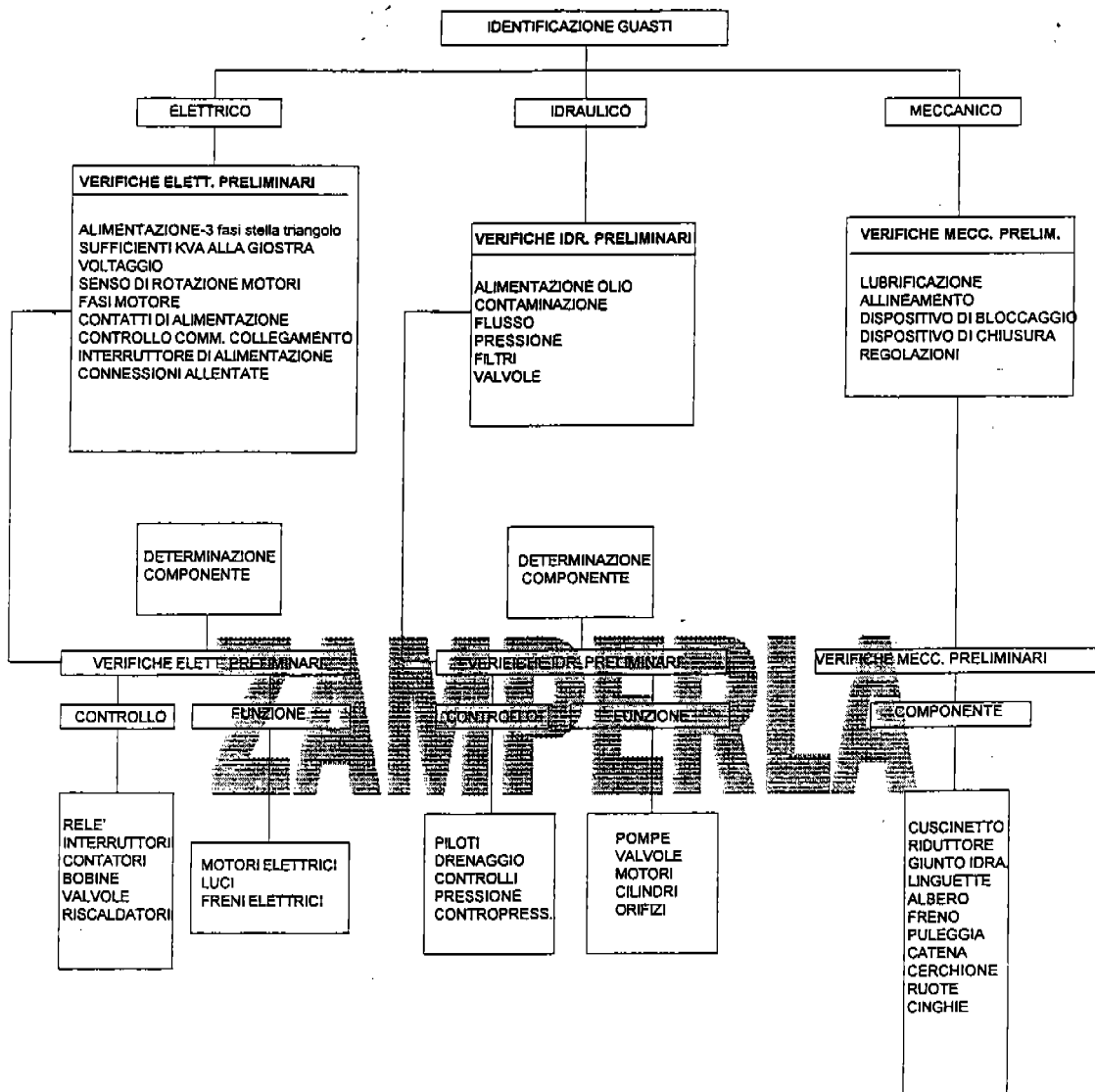
- 1) Have the ride serial number and the name available.
- 2) Have the manual ready for use as reference.
- 3) If the ride was formerly owned, it would be useful to know by whom (company records will show the changes made to the ride by the previous owner).
- 4) Be sure the same person makes all calls and also be sure to get the name of person in question, so that all calls will be made to that person.
- 5) Give your telephone number to the factory.
- 6) Have shipping instructions ready to give, such as how, when, and where to ship parts.
- 7) List all the alterations of the ride and all the modifications which have been carried out.
- 8) A skilled person should be able to detect any problem such as: if the problem is gradual or if it suddenly disappeared; if there are unusual noises; if the problem occurs periodically or continuously; if the ride runs in one direction only or if it operates regularly but showing difficulties in braking or stopping.
- 9) Without calling the factory, some problems can be easily solved simply referring to the following chart. This can avoid several expensive phone calls or a more expensive visit by a factory representative as well as valuable time.

PROCEDURE DI SEGNALAZIONE GUASTI

Prima di aver bisogno dell'aiuto del costruttore per eventuali problemi ad una giostra, devono essere fatte alcune cose per evitare perdite di tempo da ambo le parti.

- 1) Avere il numero di serie della giostra e il nome disponibili.
 - 2) Avere il manuale pronto da usare per eventuali riferimenti.
 - 3) Se la giostra apparteneva già a qualcuno sapere a chi (la documentazione della compagnia mostra i cambiamenti fatti sulla giostra dal precedente proprietario).
 - 4) Assicurarsi di avere il nome della persona con cui si conferisce abitualmente in ditta così le telefonate saranno fatte solo a quella persona.
 - 5) Fornire il vostro numero di telefono alla ditta.
 - 6) Fornire tutte le istruzioni necessarie per la spedizione dei ricambi.
 - 7) Segnalare tutte le alterazioni e modifiche che sono avvenute sulla giostra.
 - 8) Assicurarsi che la persona che segnala il guasto sia competente e quindi atta a descrivere le varie problematiche della giostra come ad es., se il problema è una cosa graduale, se è improvvisamente scomparso, se si manifestano rumori non usuali, se il problema si manifesta continuamente o a intermittenza, se la giostra va in una sola direzione, oppure la giostra funziona ma non frena o non si ferma, ecc.
 - 9) Spesso il problema che si presenta è molto più semplice di quanto si pensi, quindi prima di telefonare alla fabbrica consultare la tabella riportata nella pagina accanto.
- Consultate attentamente questa tabella, questo vi farà risparmiare molte telefonate e tempo.





RESIDUAL CURRENT DEVICE WITH MAGNETIC - THERMAL SWITCH

The residual current circuit breaker provides a safe protection even when the power supply middle wire is accidentally interrupted.

Equipments are provided with a built-in protection against overloads and short circuits up to their plate nominal value. They also guarantee a protection against the overload of the output wires.

In protection systems using direct earthing of metal frames, the coordination with the residual current circuit breaker provides an additional protection against the current dispersion to earth; this means safety in the case of electrical contacts.

The residual current circuit breaker is provided with a direct release device which can switch off the system downstream when, for an accidental contact of a person with powered elements, a current from one of the installed power supply wires, equal or higher than the nominal sensitivity, flows to earth through the body of the person or the earth wire.

NOTE:

The circuit breaker does not eliminate the sensation of electric shock, but reduces the time during which the current flows through the human body to such an extent, that the possibility of a lethal effect is considerably reduced.

The residual current circuit breaker indicates the type of malfunction that caused its release in a selective way, thus making it easier to locate and eliminate the fault it-self.

1- Black control lever in low position (OFF): intervention due to overload or short circuit.

2- Black control lever in low position (OFF) and blue lever in low position (OFF): residual current intervention due to current dispersion to earth.

When the residual current operated circuit breaker is released, the black and the blue levers are in the OFF position.

After eliminating the cause of the release, reset the breaker by positioning first the blue, then the black lever to the ON position.

In case of an intervention due to overloading, the blue lever remains in the ON position, while the black lever moves to the OFF position.

After eliminating the cause of the release, reset the breaker by positioning the black lever to the ON position.

The installation of the residual current circuit breaker increases the safety level of the electric installation and of the people using it.

INTERRUTTORE DIFFERENZIALE CON SGANCIATORE MAGNETOTERMICO

L'interruttore differenziale offre una protezione anche nel caso in cui s'interrompe il conduttore di neutro dell'alimentazione.

Gli apparecchi hanno incorporata la protezione contro sovraccarichi e cortocircuiti e sono quindi automaticamente protetti contro i cortocircuiti fino al valore nominale di targa e garantiscono inoltre la protezione contro i sovraccarichi dei conduttori in uscita.

Nei sistemi di protezione che utilizzano la messa a terra diretta delle masse metalliche, il coordinamento con essa dell'interruttore differenziale magnetotermico fornisce una protezione addizionale contro la dispersione di corrente verso terra; ciò significa un aumento della sicurezza in caso di contatti elettrici.

L'interruttore differenziale è dotato di dispositivo a sgancio diretto atto a togliere tensione all'impianto a valle quando, per un contatto accidentale di persone con parti in tensione, da un conduttore d'alimentazione dell'impianto fluisce a terra tramite il corpo della persona o il conduttore a terra una corrente uguale o superiore alla sensibilità nominale.

N.B. L'interruttore non elimina la sensazione provocata dalla scossa elettrica, ma limita la durata del passaggio di corrente nel corpo umano a tempi così brevi da ridurre a valori trascurabili le probabilità di effetti letali.

L'interruttore differenziale segnala selettivamente il tipo di guasto che ne ha provocato l'apertura, rendendo quindi più facile l'individuazione e eliminazione del guasto stesso.

1- Leva di comando in basso (posizione OFF): intervento per sovracorrente o cortocircuito.

2- Leva di comando in basso (posizione OFF) e leva blu in basso (posizione OFF): intervento differenziale per dispersione di corrente verso terra.

In caso di intervento differenziale, la leva nera e quella blu sono in posizione OFF. Dopo aver eliminato la causa dell'intervento ripristinare l'interruttore portando prima la leva blu e poi quella nera in posizione ON.

In caso di intervento per sovraccarichi, la leva blu rimane in posizione ON mentre quella nera in posizione OFF. Dopo avere eliminato la causa dell'intervento ripristinare l'interruttore portando la leva nera in posizione ON.

L'installazione dell'interruttore differenziale aumenta sensibilmente il livello di sicurezza dell'impianto elettrico e delle persone che lo utilizzano.

Il fatto di avere installato un differenziale, non esime però da tutte le cautele necessarie da parte di chi usa l'energia elettrica.

In particolare:

- ricordare di premere il tasto di prova "T" ogni mese.

However, the installation of a residual current breaker does not mean exemption from all the precautions which should be taken by using the electric power.

In particular:

- remember to push the test button "T" each month.

The residual current breaker should then snap, otherwise replace it.

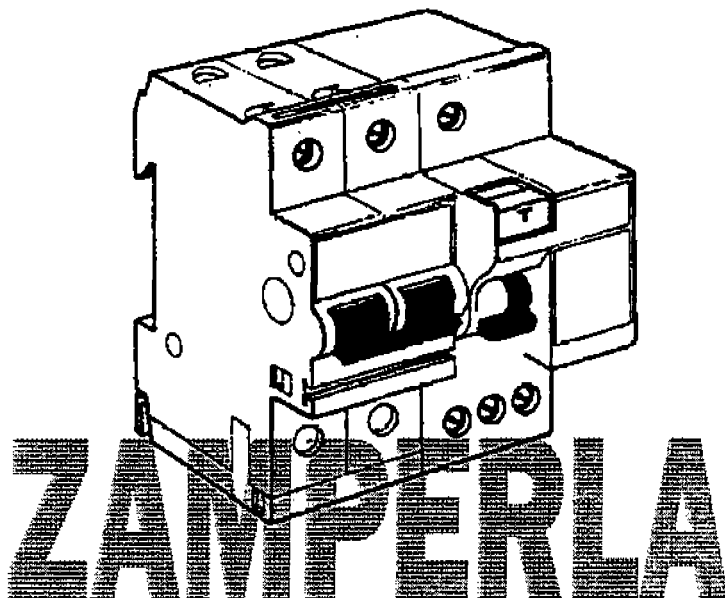
- before changing bulbs or fuses, be sure that the power is turned off in the whole installation by opening the general breaker.

- do not leave unshielded wires, but replace them.

Il differenziale deve scattare. Se ciò non avvenisse provvedere alla sua sostituzione.

- prima di effettuare cambi di lampade e di fusibili, accertarsi di avere tolto tensione a tutto l'impianto, aprendo l'interruttore generale.

- non tollerare che vi siano fili spellati, ma provvedere alla loro sollecita sostituzione.



INDUCTION MOTORS PROTECTION

The motors have a IP 44 degree of protection. They are therefore protected against contact with live parts as well as tools or similar, against spraying or splashing water and also against the introduction of solid bodies greater than 1 mm.

The terminal-box has a IP 55 degree of protection.

TECHNICAL SPECIFICATIONS

The motor-housing is externally ribbed and is made of high-quality cast-iron.

Ventilation is obtained by means of an external fan made of aluminium alloy or thermosetting resin.

The external fan is connected with the opposite drive-end and is protected by a cast-iron guard.

Rotation may be clockwise or counterclockwise.

The stator unit which is made of low-loss iron sheets is automatically welded and then strongly fixed to the housing.

The rotor is formed by a die-cast aluminium cage and is firmly fixed to the shaft either by knurling or by sunk keys and is always dynamically balanced.

BEARINGS

The motors up to type "160" are mounted with permanently lubricated bearings.

From type "180" onwards the motors are mounted with open, ball, roller bearings or bearings with greasers.

TERMINAL-BOX

The standard terminal plate has 6 terminals marked with letters U1-V1-W1 for the beginnings of the 3 phases and U2-V2-W2 for the 3 ends.

The six terminals arrangement with delta or star connection allows the motor feeding with two voltages (for example 220 Volt 380 Volt).

The terminal-box can be turned in steps of 90° to take up any of the four possible positions.

MOTORI ASINCRONI PROTEZIONI

I motori hanno il grado di protezione IP 44. Sono quindi protetti contro i contatti con le parti in tensione anche con utensili e simili contro spruzzi e getti d'acqua e contro l'introduzione di corpi solidi di dimensioni superiori al millimetro.

La scatola morsetti ha invece il grado di protezione IP 55.

PARTICOLARI COSTRUTTIVI

La carcassa alettata esternamente, è in fusione di ghisa di alta qualità. La ventilazione è ottenuta con una ventola a pale radiali in resina termoindurente o in lega di alluminio, calettata esternamente dal lato opposto a quello di comando e protetta da una calotta in ghisa.

Essa consente il funzionamento nei due sensi di rotazione.

Il pacco statorico, in lamierino a bassa cifra di perdita, viene saldato con macchine automatiche e poi rigidamente fissato alla carcassa. Il rotore in gabbia d'alluminio pressofuso è fortemente bloccato sull'albero con zigrinatura o con chiavetta e viene sempre equilibrato dinamicamente.

CUSCINETTI

I motori portano montati fino al tipo "160" cuscinetti schermati a lubrificazione permanente. Dal tipo 180 in poi vengono invece montati su cuscinetti a sfere aperti oppure cuscinetti a rulli inscatolati o muniti di ingrassatori.

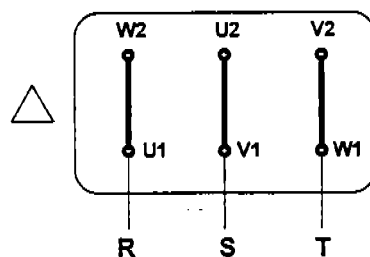
MORSETTIERA

La morsettiiera normale ha sei morsetti, contrassegnati dalle lettere U1-V1-W1 per i principi delle tre fasi e dalle lettere U2-V2-W2 per i tre finali.

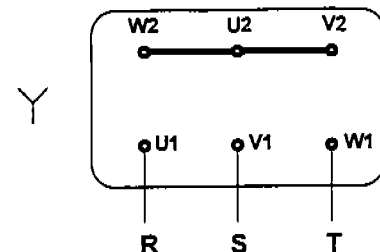
La disposizione a sei morsetti consente con il collegamento degli stessi a triangolo o a stella l'alimentazione del motore con due tensioni (per esempio 220 Volt 380 Volt).

La scatola morsettiiera è orientabile verso 4 direzioni a 90° tra loro.

DELTA CONNECTION 220 Volt
COLLEGAMENTO TRIANGOLO 220 Volt



STAR CONNECTION 380 Volt
COLLEGAMENTO A STELLA 380 Volt



WINDINGS

The electric windings of the stator are made of copper wire with a double-thickness enamelling in polyvinyl resin.

Insulation between the phases and between the ground and the phases is guaranteed by the special insulating material used.

A very high degree of insulation is achieved by an impregnation with hot polymerizing varnish which offers great protection from moisture, heat and ageing.

The motors can function normally and produce rated output also with a combined deviation of voltage and frequency equal to $\pm 5\%$.

All the motors can function either clockwise or counterclockwise. According to CEI 2-8, the rotation can be seen remaining in front of the shaft end. To invert the rotation, change the position of the two terminals.

ELECTRICAL CONNECTION

To connect the supply-wires to the terminal-box, cables with an adequate section must be used so as to avoid strong fall in voltage.

The law states that an electric motor must be properly earthed and this may be done simply by connecting the grounding terminal to the grounded system.

This is, of course, fundamental for safety.

MAINTENANCE

All the modern asynchronous motors need very little maintenance.

If the motor operates in a dusty or dirty place it is advisable to clean it periodically on the outside to ensure good conditions and a longer life.

Motors type "160" need no lubrication as they are fitted with permanent lubrication bearings.

For types from "160" onwards it is advisable a periodical checking for lack of grease in bearings and general efficiency is advisable.

Grease should be changed every 10.000 hours.

As soon as a ball-bearing shows signs of excessive wear or becomes noisy, it should be replaced without any further delay.

Finally, particular care should be taken in making sure that the feed-line and the motor terminal-box are in good order/condition.

AVVOLGIMENTI

Gli avvolgimenti elettrici dello statore vengono realizzati con filo di rame smaltato a doppio spessore di resine poliviniliche. L'isolamento tra le fasi e verso la massa è garantito dagli speciali materiali isolanti impiegati.

L'impregnazione finale con vernice isolante polimerizzante a caldo assicura al complesso un ottimo isolamento ed una buona resistenza all'umidità, al calore e all'invecchiamento.

I motori possono funzionare normalmente erogando la potenza di targa anche con uno scarto combinato di tensione e frequenza pari a $\pm 5\%$.

Tutti i motori possono funzionare indifferentemente nei due sensi di rotazione, orario e antiorario. Secondo le norme CEI 2-8, il senso di rotazione di un motore elettrico è quello che si vede stando di fronte all'estremità dell'albero. Per invertirlo basta scambiare tra di loro due morsetti.

ALLACCIAMENTO ELETTRICO

Per il collegamento della linea alla morsettiera si devono usare cavi che abbiano una sezione adatta alla corrente di targa del motore, tali cioè da non provocare una forte caduta di tensione.

Il motore elettrico deve per legge essere collegato all'impianto di terra. Si ricorda che tale operazione è fondamentale per la sicurezza delle persone.

MANUTENZIONE

Tutti i moderni motori elettrici richiedono poca manutenzione. Per una buona conservazione del motore si raccomanda di effettuare periodicamente una pulizia esterna dello stesso, specie se lavora in ambienti sporchi e polverosi.

Per quanto riguarda la lubrificazione non è necessaria alcuna manutenzione per i tipi fino "160" in quanto su essi vengono montati cuscinetti a sfere a lubrificazione permanente.

Per i tipi dal "160" in su è bene controllare periodicamente la regolarità di marcia dei cuscinetti e provvedere a eventuali aggiunte di grasso. Ogni 10.000 ore il grasso va sostituito. Appena un cuscinetto denota difetti o rumorosità eccessiva va subito sostituito senza attendere ulteriori guasti. Particolare cura va infine posta nel mantenimento in ottima efficienza della linea di alimentazione elettrica e della morsettiera del motore.

GEARBOX

LUBRICATION

The correct lubrication of the gearbox ensures the maximum performance.

It is useful to remember that a large quantity of lubricant and highly viscous oils contribute to a low efficiency especially on high output speed helical gearboxes.

On the contrary it is extremely important to lubricate worm gearboxes with highly viscous oils to guarantee a tougher lubricating film.

It is very important to consider the environment conditions in which the unit works because elements, such as temperature, are extremely important to select the correct lubricant and its viscosity.

RIDUTTORI

LUBRIFICAZIONE

La lubrificazione riveste una notevole importanza nel raggiungimento delle prestazioni ottimali dei riduttori per cui è utile ricordare che un livello molto alto del lubrificante ed una viscosità elevata, contribuiscono ad una riduzione del rendimento in modo particolare nei riduttori con elevate velocità di rotazione. Al contrario, nei riduttori a vite senza fine è indispensabile ricorrere a lubrificanti più viscosi per poter garantire la presenza di una pellicola lubrificante più tenace.

E' inoltre molto importante valutare le condizioni ambientali in cui opera il riduttore in quanto fattori come la temperatura sono fondamentali per la scelta del corretto tipo di lubrificante e della sua viscosità.

OIL

OLIO

Temp. ambiente Ambient temperat.	-10°C + 50°C			-30°C + 100°C	-10°C + 60°C
Tipo di lubrificante Lubricant	Olio minerale Mineral oil			Olio sintetico Syntetic oil	Grasso sintetico Syntetic grease
Riduttori Gearbox	A vite senza fine Helical gear	A vite senza fine Helical gear	A vite senza fine Worm gear	A ingran. s. fine Hel. and worm gear	A ingr. vite s. fine Hel. and worm gear
Tipo di carico Load	Medio Normal	Pesante Medio Heavy Normal	Pesante Heavy	Medio Pesante Normal Heavy	Medio Pesante Normal Heavy
IP	Mellana Oil 220	Mellana Oil 220	Mellana Oil 460	Telesia Oil 150	Telesia Compound A
ESSO	Spartan EP 220	Spartan EP 320	Spartan EP 460	S 220	EGL 3818A
AGIP	Blasia 220	Blasia 320	Blasia 460	Blasia S	
MOBIL	Mobilgear 630	Mobilgear 632	Mobilgear 634	Glycoil 30	Glicoil Grease 00
SHELL	Omala EP 220	Omala EP 320	Omala EP 460	Tivela Oil WB	Tivela Compound A
BP	Energol GR-XP 220	Energol GR-XP 320	Energol GR-XP 460	Energol SG-XP 220	Energrease G-SF
TEXACO	Meropa 220	Meropa 320	Meropa 460	Rando Oil HD Cz-68X	Glissandro GF 1064
TOTAL	Carter EP 220	Carter EP 320	Carter EP 460		

MAINTENANCE

No maintenance is required for grease filled gearboxes.

For units filled with oil the following steps should be carried out:

- a) internal cleaning
- b) oil refill

INTERNAL CLEANING

It is preferable to carry out this operation when the oil is still hot allowing the unit to drain, then rinse the unit with a bland solvent so as not to damage the painting.

The unit should be rinsed with the same lubricant used during the unit operation.

LUBRICANT REFILL

The lubricant in a gearbox should be changed according to the following intervals:

Oil temperature	Duty	Interval
<60°C	continuous	5000 h
	intermittent	8000 h
>60°C	continuous	2500 h
	intermittent	5000 h

The data refer to mineral base lubricants. Synthetic lubricants (grease or oils) if used in normal temperatures, can be considered long lasting lubricants as long as care is taken to avoid the lubricants pollution.

IMPORTANT

Synthetic lubricants cannot be mixed and are not compatible with conventional mineral base lubricants.

Before any change from a conventional to a synthetic lubricant it is advisable to wash the units following the procedure outlined below: drain the unit as much as possible. Refill the gearbox with an appropriate solvent (it is advisable non-inflammable chlorinate) and run the unit at a reduced load and speed. Drain the solvent and rinse until all traces of solvent have disappeared.

At this point the unit can be filled with synthetic lubricant.

STOCKING

Units left inactive for long periods should be adequately protected, especially units that operate outside or in salty environment.

The external parts of the units that are subject to rust should be protected with an appropriate protective, that should be reapplied periodically. The units should then be filled and completely sealed. Every 4 - 5 months the units should be run for brief periods.

MANUTENZIONE

Per i riduttori lubrificati con grasso sintetico non è necessaria alcuna manutenzione.

Per quelli previsti per lubrificazione a olio si consiglia di seguire le seguenti norme:

- a) pulizia interna
- b) sostituzione olio

PULIZIA INTERNA

E' utile effettuare questa operazione con l'olio ancora caldo facendolo fuoriuscire e risciaquando con solventi blandi per non danneggiare la verniciatura.

Si farà seguire una risciaquatura utilizzando lo stesso tipo di olio previsto per il funzionamento effettivo.

SOSTITUZIONE DEL LUBRIFICANTE

Come intervallo di cambio delle cariche di lubrificante, ci si può attenere indicativamente al prospetto sottoriportato:

Temperatura olio Servizio		Intervallo
<60°C	continuo	5000 h
	intermitt.	8000 h
>60°C	continuo	2500 h
	intermitt.	5000 h

I dati riportati si riferiscono ai lubrificanti a base minerale. I lubrificanti sintetici (grassi o oli) se usati in un campo di temperature normali, possono essere previsti per una lubrificazione a lunga vita avendo però l'accortezza di evitare l'inquinamento dei lubrificanti stessi

IMPORTANTE

I lubrificanti sintetici non sono miscelabili ne compatibili con lubrificanti convenzionali a base di oli minerali, per cui per passare da un tipo convenzionale ad uno sintetico si raccomanda di effettuare un lavaggio preventivo seguendo la procedura : scaricare il lubrificante in uso quanto più completamente possibile. Riempire quindi con un solvente adatto (consigliabili i solventi clorurati non infiammabili di pronta evaporazione) e fare funzionare a carico e velocità ridotti. Scaricare il solvente e ripetere il lavaggio fino a quando questo non venga scaricato pulito, assicurarsi della completa evaporazione dello stesso, a questo punto immettere il lubrificante sintetico.

STOCCAGGIO

Per i riduttori lasciati inattivi per lunghi periodi è necessario prevedere una protezione adeguata, in modo particolare per i gruppi operanti all'aperto o in ambiente salino. Proteggere le parti esterne soggette ad ossidazione con prodotti adeguati ripristinandoli periodicamente. Riempire i riduttori e chiuderli ermeticamente. A intervalli di 4-5 mesi effettuare una rotazione dell'albero lento.

MAIN BEARING

MAIN BEARING LUBRICATION

For such operation you must use non-hygroscopic lubricants without acid or resin, resistant to aging and with a large range of operational temperature, see tab.1.

The complete lubrication is used in order to reduce the friction, to seal and to prevent corrosion.

Therefore we suggest to lubricate so that the grease comes out of the labyrinths between the rings and

forms a grease film along the circumferential development of the bearing labyrinths or of the seal packings.

The bearing must be rotating during the greasing operation.

It is necessary to grease also the coupling between the bearing toothing and the coupling pinion (warning: carry out this operation with standstill bearing).

The frequency of lubrications must be chosen in relation to the operating conditions.

Normally the lubrication operation must be done every 100 operating hours.

We recommend more frequent lubrications in tropical areas, in very humid and dusty places impregnated of impurities and subject to high thermal changes. Before and after a long period of inactivity it is absolutely necessary to lubricate in particular for the winter period.

CONTROL OF BOLTS

To compensate the settling phenomenons it is necessary to check that the locking of the fixing bolts complies with the prescribed torque values.

During this operation the bolted connection must be released from tensile stress caused by external forces.

This control must be carried out within the first 100 hours of operation and then it is advisable every about 600 hours.

The control interval has to be reduced in case particular operating conditions prevail or in case it is a question of devices for which specific control rules are required.

CUSCINETTI DI BASE

LUBRIFICAZIONE CUSCINETTI DI BASE

Per tale operazione, come per ogni successiva lubrificazione, usare solo lubrificanti privi di acidi, di resina, non igroscopici, resistenti all'invecchiamento e con campo di variazione della temperatura idoneo all'impiego del cuscinetto, vedere tabella 1. L'ingrassaggio completo ha lo scopo di ridurre l'attrito, fare tenuta e proteggere dalla corrosione.

Si raccomanda quindi di ingrassare in modo tale che il grasso esca dai labirinti tra gli anelli e formi un collare di grasso lungo lo sviluppo circonferenziale dei labirinti del cuscinetto o delle guarnizioni di tenuta. Il cuscinetto deve essere in rotazione durante l'operazione di ingrassaggio.

E' necessario ingrassare anche l'accoppiamento fra la dentatura del cuscinetto e il pignone di accoppiamento (attenzione effettuare questa operazione con cuscinetto fermo). La frequenza delle lubrificazioni deve essere scelta in funzione delle condizioni d'esercizio. In genere l'operazione di lubrificazione deve essere effettuata ogni 100 ore di esercizio. Si raccomandano lubrificazioni più frequenti in ambienti tropicali, in luoghi molto umidi, polverosi, impregnati di impurità e soggetti a forti sbalzi termici. Prima e dopo un lungo periodo di inattività è assolutamente necessaria una lubrificazione. Ciò vale in particolare per la pausa invernale.

CONTROLLO DEI BULLONI

Per compensare i fenomeni d'assestamento è necessario verificare che il serraggio dei bulloni di fissaggio sia conforme ai valori di coppia prescritta.

Durante questa operazione il collegamento bullonato deve essere scaricato da sollecitazioni a trazione provocate da forze esterne.

Questo controllo deve essere eseguito entro le prime 100 ore d'esercizio ed in seguito è consigliabile avvenga ogni ca. 600 ore d'esercizio. L'intervallo di controllo è tuttavia da ridurre nel caso in cui prevalgano condizioni particolari d'esercizio oppure si tratti di apparecchi per i quali siano previste specifiche norme di controllo.

	ARALUB HLP 2	-25°C +130°C
	ENERGREASE LS-EP2	-25°C +130°C
	SPHEEROL EPL2	-20°C +120°C
	EPEXA 2	-20°C +120°C
	BEACON EP 2	-25°C +130°C
	CENTOPLEX 2 EP	-20°C +120°C
	MOBILUX EP 2	-20°C +120°C
	STABYL LEP 2	-20°C +120°C
	CALITHIA EP FETT T 2	-25°C +130°C
	MULTIFAK EP 2	-25°C +130°C

TIGHTENING TORQUES

The suggested values, in the below table, are purely indicative.

They are applicable to metric boards in compliance with DIN 13 and to support heads surfaces, according to DIN 912-931-7984-6912 and 7990. These values allow an exploitation at 90% of the yield screws.

For their determination, it has been supposed a friction coefficient of 0.14 (new screw, non lubricated, non treated)

ATTENTION

With minimum friction coefficients, for example, found on screws treated with MOS 2 paste and in the junction elements covered with cadmium on both sides, the twinsting moment requires a reduction of about 20%.

VALORI DI SERRAGGIO

I valori proposti nella tabella sottostante sono puramente orientativi, applicabili a filetti metrici conformi DIN 13, nonché a superfici d'appoggio testè conformi DIN 912-913-934-7984-6912 7990. Con gli stessi si ottiene uno sfruttamento al 90% dello snervamento delle viti.

Per la determinazione è stato supposto un coefficiente d'attrito pari a 0.14 (vite nuova, non lubrificata non trattata)

ATTENZIONE

In presenza di coefficienti d'attrito minimi, che si riscontrano ad esempio nelle viti trattate con pasta MOS 2 e negli elementi di congiunzione rivestiti da entrambi i lati con cadmio, il momento torcente richiede una riduzione del 20% circa.

	Classificazione secondo le norme DIN 267						 mm
	Classification according DIN 267						
	Tightening torque (Nm)						
	Valori indicativi di serraggio (Nm)						
	3.6	5.6	6.9	8.8	10.9	12.9	
M 4	1.0	1.3	2.6	3.0	4.3	5.1	7
M 5	2.0	2.6	5.1	6.0	8.5	10.2	8
M 6	3.4	4.5	8.7	10.3	14.7	17.6	10
M 7	5.6	7.4	14.2	17.1	24.5	28.4	11
M 8	8.2	10.8	21.6	25.5	35.3	42.2	13
M 10	16.7	21.6	42.2	50.0	70.6	85.3	15
M 12	28.4	38.2	73.5	87.3	122	147	18
M 14	45.1	60.8	116	138	194	235	22
M 16	69.6	93.2	178	211	299	358	24
M 18	95.1	127	245	289	412	490	27
M 20	135	180	384	412	579	696	30
M 22	182	245	471	559	784	941	32
M 24	230	309	598	711	1000	1196	36
M 27	343	461	887	1049	1481	1775	41
M 30	466	623	1206	1422	2010	2403	46
M 33	632	848	1628	1932	2716	3266	50

LUBRICATION

For the reliability of ball bearings and components in rotation, they must be well lubricated:

Their lubrication will avoid direct contact (metal/metal) between the rolling part.

The choice of the right lubricant and type of lubrication are important, as well as a good maintenance.

The lubricant choice depends from the works conditions of the part, as temperature, speed and environment influence.

Due to the mechanical action, ageing, and impurity accumulation, the lubricant loses its characteristics and it is necessary to refill it up and change it every now and then.

Due to the large lubricants variety, especially greases, there would be differences in types similar, we suggest grease lithium soap with E.P. characteristics (wing pressure) with a working temperature range from -30 up to 110 C°.

RELUBRICATION

The relubrication depends on many factors, rotation, speed, working temperature, grease type and working environment.

So, we can only suggest:

- Ball bearings, every 6 months.

- Gears, every time you note a direct contact metal/metal, generally every month.

For your information we list some brands and codes of greases.

LUBRIFICAZIONE

Affinchè possano funzionare in maniera affidabile i cuscinetti e le parti meccaniche in rotazione devono essere adeguatamente lubrificate: la loro lubrificazione serve ad impedire contatti diretti, metallo su metallo, tra le parti interessate al rotolamento. La scelta di un lubrificante adatto e del metodo di lubrificazione specifico per ogni applicazione è quindi importante, analogamente ad una manutenzione ben fatta.

La scelta di un lubrificante dipende soprattutto dalle condizioni di lavoro dell'organo da lubrificare, ossia dalla temperatura, dalla velocità, nonché dall'influenza dell'ambiente circostante.

A causa dell'azione meccanica, dell'invecchiamento e dall'accumulo di impurità, il lubrificante immesso in un sistema perde gradualmente le sue proprietà, pertanto è necessario effettuare delle aggiunte o delle sostituzioni di tanto in tanto.

Poichè c'è disponibilità di una grande varietà di lubrificanti e, specie per quanto riguarda i grassi, ci possono essere delle differenze nelle proprietà lubrificanti di tipi apparentemente identici, noi consigliamo di utilizzare grassi al sapone di litio con caratteristiche E.P. (estrema pressione) che hanno un campo di temperature di lavoro molto vasto (da -30 a +110°C) quindi adatti a tutti i nostri impieghi.

RILUBRIFICAZIONE

Il momento in cui si deve provvedere alla rilubrificazione dipende da molti fattori che sono interconnessi in maniera piuttosto complessa.

Si tratta di fattori che comprendono, la velocità di rotazione, la temperatura di lavoro, il tipo di grasso, l'ambiente in cui opera.

E' pertanto possibile dare solo delle indicazioni basate su dati statistici:

-Cuscinetti, effettuare una rilubrificazione ogni 6 mesi

- Ingranaggeria e rotolamento, applicare del grasso quando si nota un contatto diretto tra metallo e metallo, generalmente ogni mese.

A titolo informativo elenchiamo alcune marche e sigle di grassi.

AGIP:	GR-MU/EP
CHEVRON:	DURA LIGHT GREASE-EP
ESSO:	BEACON EP
IP:	ATHESIA-EP
MOBIL:	MOBILTEMP 78
SHELL:	ALVANIA EP

USE AND ADJUSTMENTS USO E REGOLAZIONI

ELECTRICAL BOARD

Large board waterproof, it contains all the fit apparatuses to the operation and to the safety of all the functions of the ride.

The general switch is endowed with differential device of safety earth.

SOFT START

Inside the electrical board, a soft start is installed and permits to have Start and Stop of the ride with a ramp speed procedure.

This device is provided with two potentiometers.

PUSH BUTTON PANNEL

It contains all the buttons to operate the ride. The push button panle is mounted over the electrical board.

LIGHTS BOARD

The lights board is mounted of the main frame of the ride, and it caontain all the devices to drives corredctly the lights insatlld in the ride.

QUADRO ELETTRICO

E' un cassone stagno contenente tutte le apparecchiature atte al funzionamento ed alla sicurezza di tutte le funzioni della giostra.

L'interruttore generale è dotato di dispositivo differenziale di terra di sicurezza.

AVVIATORE

All'interno del quadro elettrico è installato un avviatore elettronico, che permette di ottenere delle partenze in rampa della giostra.

Tale avviatore ha due potenziometri di regolazione sul frontalino

PULSANTIERA

La pulsantiera permette di effettuare tutte le operazioni di funzionamento della giostra. La pulsantiera vien montata sopra al quadro elettrico di movimentazione

QUADRO LUCI

Il quadro elettrico delle luci è montato direttamente sul telaio della giostra, e contiene tutte le apparecchiature per il funzionamento delle luci installate nella giostra.

ZAMPERLA

OPENING CLOSING OPERATION OF THE RIDE

This type of merry-go-round comes sold in the version on towing and in the fixed version.

Version on towing:

- a) Position the ride in the desired position.
- b) Remove the shaft and the back bumper, unthreading the fixing pins.
- c) Lower the four legs of the base, having care of carry the ride in perfectly horizontal position.
- d) Connect the electrical cable in the special connector to supply the electrical winch: These winch are used to position the platforms.

e) Low the front and back platforms using the electrical winches.

The steel cables of the winches must be positioned in the special hooks realized in the platforms.

f) Move now the steel cables it special hooks of the two lateral platforms. low the lateral platforms using the electrical winches.

g) When these operations are finished remove all the safety pins of the platforms.

h) Lift the two lateral sides of the background.

This operation must be effected from at least two people, in consideration of the weight of the background.

i) Lift the lights printing "Speedway" and block it by means the special pins.

l) Lift now the lateral parts of the background.

m) Connect the electrical board to the main supply.

Fixed version

Same procedure, beginning from the c point

APERTURA E CHIUSURA DELLA GIOSTRA

Questo tipo di giostra viene venduta nella versione su rimorchio e nella versione fissa.

Versione su rimorchio:

- a) Posizionare la giostra nella posizione desiderata.
- b) Togliere il timone, sfilando le spine di fissaggio.
- c) Abbassare i piedini della base, avendo cura di portare in posizione perfettamente orizzontale la giostra.

d) Connettere i cavi elettrici nell'apposito connettore per alimentare i due verricelli di posizionamento delle piattaforme (uno anteriore ed uno posteriore)

e) Abbassare la piattaforma anteriore e la piattaforma posteriore della giostra agendo sui verricelli.

Per effettuare tale operazione i cavi dei due verricelli devono essere agganciati negli appositi ganci.

f) Spostare ora i cavi dei verricelli nei ganci delle due piattaforme laterali. Agire ora sui verricelli per abbassare le due piattaforme laterali.

g) Quando queste operazioni sono concluse si possono togliere i fermi di sicurezza delle piattaforme.

h) Alzare le due parti laterali dello scenario;

Tale operazione deve essere effettuata da almeno due persone, in considerazione del peso dello scenario stesso.

i) Sollevare la scritta posta sopra allo scenario, e bloccare il tutto mediante le apposite spine di sicurezza.

l) alzare ora le due parti laterali dello scenario

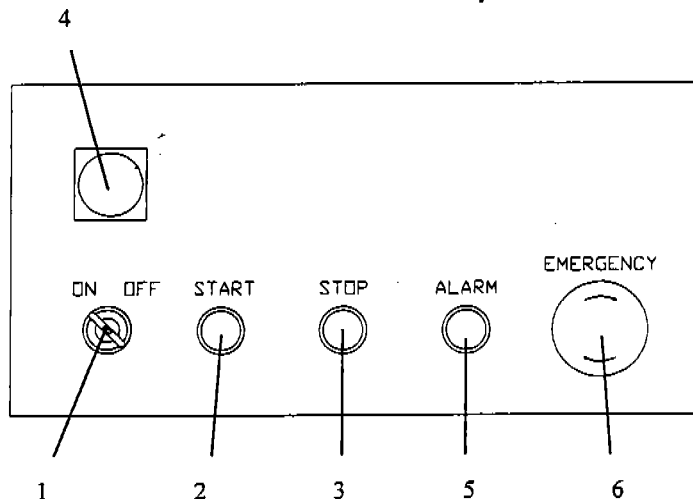
m) Collegare il quadro elettrico all'alimentazione.

Versione fissa

Stessa procedure della versione su rimorchio tranne per le parti riguardanti il rimorchio.

PUSH BUTTON PANEL

PULSANTIERA



1) When key switch is put (by means a specific key) on ON, operation take place through pushbutton panel, when off the panel is disactivated.

2) When start button is pushed, the automatic cycle operation is activated; as soon as the timer comes to an end, the ride stops.

3) When stop button is pressed the ride stop even though the time is not finished.

4) By means of the timer you can set in the duration of the automatic cycle.

5) When Emergency button is pressed the ride comes to a Stop.

1) Commutatore a chiave KEY, ruotato (con l'apposita chiave) verso ON, permette di operare con la pulsantiera, ruotato verso OFF diastiva le funzioni della stessa.

2) Pulsante di START, premuto da inizio al ciclo di funzionamento.

3) Pulsante di STOP, permette di fermare la giostra prima che il tempo impostato sul temporizzatore 4 sia terminato.

4) Temporizzatore, imposta il tempo di durata del ciclo automatico.

5) Pulsante ALARM, attiva un avvisatore acustico.

6) Fungo di Emergenza, se premuto provoca l'arresto delle funzioni della giostra.

MAINTENANCE

A proper maintenance procedure permits to obtain a low costs of exercise with the ride in good conditions.

a) Grease weekly the two thrust bearings by means the special grease nipples, positioned on the center part of the ride. You can see the nipples from the top part of the thrust bearings

b) Check the tightening torque of the bolts (it is very important to do this procedure by means of a dynamometric spanner) which fix the central thrust bearings. This procedure has to be executed initially after 2-3 days, and then every three months.

c) Grease weekly the thrust bearing teeth.

Check montly the consumption of the thrust bearing and pinion teeth.

In case of any anomaly is noted, please contact the ride manufacturer.

d) Initially after one week, and then montly, check the oil level in the gear box, and if necessary refill it.

For a correct maintenance, and kind of oil follow the paragraph gear box in the previous chapter.

e) Check the correct tightening of the bolts of the cars bracket. This control must be done every two weeks, because of the importance for safety matters of these brackets.

Further control the perfect integrity of these brackets, specially in welding points.

f) Daily control the perfect working state of all the safety belts installed in the cars.

g) Weekly grease the cars motion chain.

further control the tensioning of the chain; on that purpose there must be approximatively 4 cm of gap in the center in the straight part of the track.

If necessary tension it by means the two screws mounted aside of the idle bearing.

MANUTENZIONE

E' molto importante che un accurato programma di manutenzione sia seguito, per ottenere il miglior uso della macchina al minor costo di esercizio.

a) Ingrassare settimanalmente, attraverso gli appositi ingrassatori le due ralle montate nel centro della giostra. Tali ingrassatori sono visibili anche dalla parte superiore delle due ralle.

b) Verificare inizialmente dopo 2-3gg, quindi 1 volta ogni 6 mesi il serraggio delle viti delle ralle centrali. Questo controllo deve essere effettuato con una chiave dinamometrica. (Per i valori di serraggio vedi cap. precedente)

c) Ingrassare settimanalmente la dentatura della ralla.

Verificare mensilmente inoltre lo stato di usura dei denti ralla dei denti del pignone.

Lo stesso tipo di controllo deve essere effettuato anche nella corona dentata della ralla folle.

Se qualche anomalia fosse notata, contattare il costruttore per un corretto riallineamento

d) Verificare inizialmente dopo 1 settimana, quindi mensilmente il corretto livello di olio all'interno del riduttore della motorizzazione, e se necessario riempire.

Per una corretta manutenzione del riduttore, e per il corretto tipo di olio, consultare il paragrafo riduttori nel capitolo precedente.

e) Verificare il corretto serraggio dei bulloni della forcella di trascinamento delle vetture. Tale controllo deve essere fatto ogni due settimane essendo le forcelle una parte estremamente importante per la sicurezza della giostra.

Verificare inoltre che la forcella sia integra, e che non vi siano segni di spaccatura nei punti di saldatura della stessa.

f) Verificare giornalmente il buon funzionamento delle cinture di sicurezza installate nella vettura.

g) Ingrassare settimanalmente la catena di trascinamento della vettura

Verificare inoltre il corretto tensionamento della catena di trascinamento; a tale scopo ci devono essere circa 4 cm di gioco nel punto centrale nella parte dritta del percorso.

Quando necessario tensionare la catena stessa agendo sulle due viti poste a fianco della ralla folle.

h) Grease weekly the car's wheel joints.

Further grease the joints of the car's bracket to the motion chain.

i) Check after one week and then every month the current consumption of the electrical motor.

It must be lower or same of the value indicated in the motor plate

l) Check daily and before operating the ride that the track is cleared from anything.

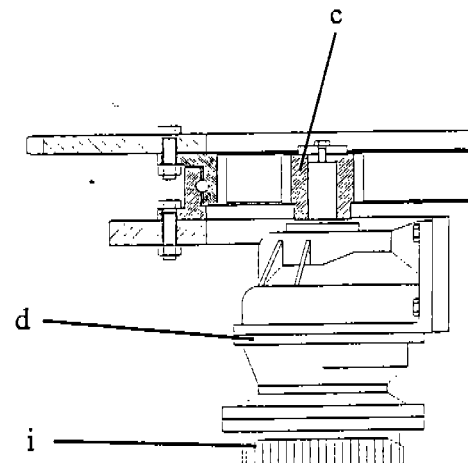
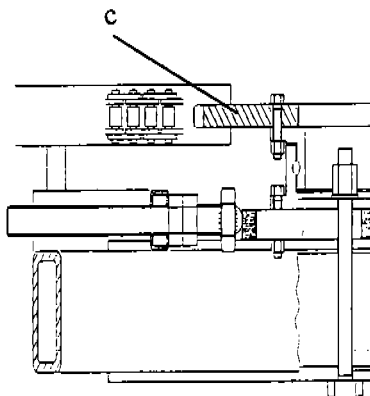
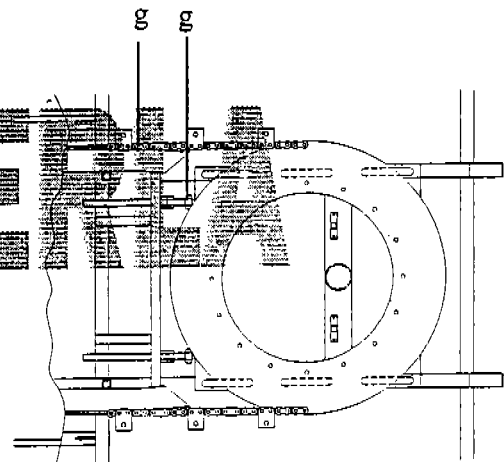
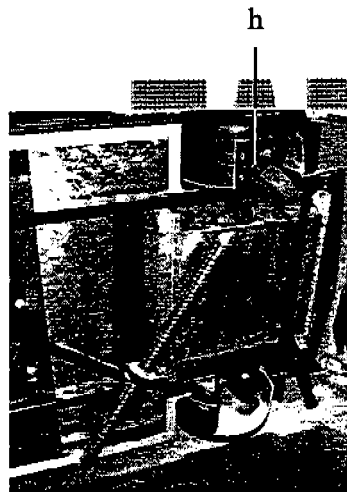
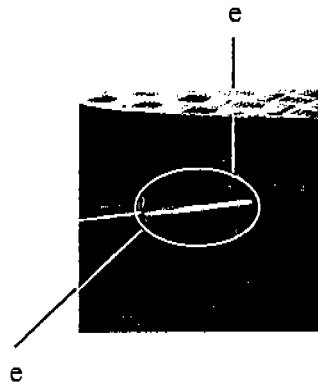
h) Ingrassare settimanalmente i giunti delle ruote della vettura.

Ingrassare inoltre i giunti di connessione della forcella vettura alla catena di trascinamento.

i) Verificare inizialmente dopo 1 settimana, quindi mensilmente l'assorbimento di corrente del motore elettrico.

Il suo valore deve essere inferiore o uguale a quello indicato nella targhetta del motore stesso.

l) Verificare giornalmente che la pista di funzionamento sia completamente sgombra da corpi estranei



GENERAL DESCRIPTION OF THE RIDE

The "Speedway" is a dedicated merry-go-round to the children;

It is sold in a version on transportable towing, and a version "fixed." The type of mechanics and the maintenance regarding the merry-go-round doesn't from the towing, and it is the same for both two models (excluded the maintenance to the towing)

FIXED STRUCTURE

It is composed from a metallic fixed structure; over it it is realized an oval track, completed with the loading unloading platforms.

On such structure there are mounted two thrust bearing that give the motion to the car's motion chain.

One of these two thrust bearing has external teeth; it receive the motion from a motor gearbox group composed from;

- a) A threephase motor
- b) A reduction gear box
- c) A pinion

The other thrust bearing works in idle mode, and its function is to control the correct motion of the chain.

The motion chain is maintained in the correct position along the track, by means green nylon slides, that can also guarantee a low friction level.

SUBJECTS

They have a form of race cars;

it is made out of a welded frame that is covered with the properly shaped and varnished fiberglass.

inside the cars it is realized a seat capable of the persons (one child and one adult)

On the lower part of the car 4 auto steering wheels permit a perfect motion of the cars also in the curve parts of the track.

The cars are "hooked" to the movimentation chain by means a special bracket, that can assure a smooth drive of the cars also in the curve part of the track thanks to the big springs mounted in it.

The seats of the cars are equipped with safety belts.

DESCRIZIONE GENERALE DELLA MACCHINA

Lo "Speedway" è una giostra dedicata ai bambini; è venduta in una versione su rimorchio trasportabile, ed una versione "fissa". Il tipo di meccanica e la manutenzione riguardante la giostra esulano dal rimorchio, e rimangono le stesse per entrambi i modelli (esclusa la manutenzione al rimorchio)

STRUTTURA FISSA

E' composta da una struttura metallica fissa, sopra alla quale è montata una pista ovale completa di piattaforme per il carico e lo scarico dei passeggeri.

Su tale struttura vengono montate due ralle, che imprimono il moto ad una catena di trascinamento dei sei soggetti montati sulla macchina.

Una di queste ralle è a dentatura esterna, e riceve il moto dal un gruppo motoriduttore composto da:

- a) Un motore trifase
- b) Un riduttore
- c) Un pignone

L'altra ralla è invece folle, e funge da guida per la catena di trascinamento.

La catena viene inoltre "guidata" lungo il percorso dai pattini di scorrimento in nylon verde, atti a garantire un buon scorrimento della catena stessa.

SOGGETTI

Sono a forma di macchina;

Sono formati da una struttura metallica elettrosaldata, rivestita da fibra di vetro opportunamente sagomata.

All'interno della macchina viene inoltre realizzato un sedile capace di una persona adulta ed un bambino.

Alla base del soggetto sono montate quattro ruote sterzanti, che permettono una perfetta movimentazione della macchina anche nella parte curva del percorso.

Il soggetto è agganciato alla catena di movimentazione mediante una speciale forcilla, in grado di garantire un comportamento "morbido" della vettura anche nelle curve.

I sedili delle vetture sono equipaggiati mediante cinture di sicurezza.

ELECTRICAL BOARD

Large board waterproof, it contains all the fit apparatuses to the operation and to the safety of all the functions of the ride.

The general switch is endowed with differential device of safety earth.

SOFT START

Inside the electrical board, a soft start is installed and permits to have Start and Stop of the ride with a ramp speed procedure.

This device is provided with two potentiometers.

PUSH BUTTON PANNEL

It contains all the buttons to operate the ride. The push button panle is mounted over the electrical board.

LIGHTS BOARD

The lights board is mounted of the main frame of the ride, and it caontain all the devices to drives corredctly the lights insatlled in the ride.

QUADRO ELETTRICO

E' un cassone stagno contenente tutte le apparecchiature atte al funzionamento ed alla sicurezza di tutte le funzioni della giostra.

L'interruttore generale è dotato di dispositivo differenziale di terra di sicurezza.

AVVIATORE

All'interno del quadro elettrico è installato un avviatore elettronico, che permette di ottenere delle partenze in rampa della giostra.

Tale avviatore ha due potenziometri di regolazione sul frontalino

PULSANTIERA

La pulsantiera permette di effettuare tutte le operazioni di funzionamento della giostra. La pulsantiera vien montata sopra al quadro elettrico di movimentazione

QUADRO LUCI

Il quadro elettrico delle luci è montato direttamente sul telaio della giostra, e contiene tutte le apparecchiature per il funzionamento delle luci installate nella giostra.

ZAMPERLA

SOFT START WESTCAR

The soft starter of the series 3850 are studied for synchronous standard three phases motors with nominal power within the electrical features of the controller, with power supply between 220 and 440 V ac.

The motor is driven with a sinusoidal wave for the start period and all the operation time.

The power to the motor is controlled with a special section composed with SCR; the resulting wave is sent to the motor according with the preset regulations.

The installed soft start is equipped with three potentiometer but only two are used.

1) Acceleration potentiometer, it permits to set the time in within the ramp has to finish.

It can be adjusted from a minimum of 0.5 sec to a max of 12 sec.

2) torque potentiometer, it permits to set the torque of the motor during the start procedura.

It can be adjusted from a minimum of 0% to a max of 90%.

The inputs of the the system are studied for relay contacts, for the Start and Stop function and for the torque potentiometer.

The contact between the pins 2 and 3 of the soft start, select the operation abilitation of the soft start, meanwhile the open contact between the pins 1-3 selects the ramp n° 1.

AVVIATORE WESTCAR

I soft starter della serie 3850 sono idonei per l'avviamento dolce di motori asincroni trifase standard con potenze nominali comprese nelle caratteristiche elettriche di ogni singolo controllo, con tensioni di alimentazione comprese tra i 220 ed i 440 V ac.

Il motore è eccitato sinisoidalmente per tutto il periodo di avviamento e funzionamento.

L'alimentazione di potenza viene controllata da un apposito stadio realizzato ad SCR; la risultante viene inviata al motore a seconda del tipo di regolazioni impostate.

Il soft start di cui è dotata la macchina è dotata di tre potenziometri dei quali ne vengono utilizzati solo 2.

1) Potenziometro rampa di accelerazione; permette di impostare il tempo entro il quale ha termine la rampa di partenza.

E' regolabile da un minimo di 0.5 ad un massimo di 12 secondi.

2) Potenziometro coppia di spunto;

permette di impostare da coppia al momento dello start.

E' regolabile da 0 al 90% della coppia nominale.

La morsetteria di comando è abilitata ad accettare gli ingressi a contatto pulito dei comandi di Start e di Stop e di selezione dei potenziometri di coppia.

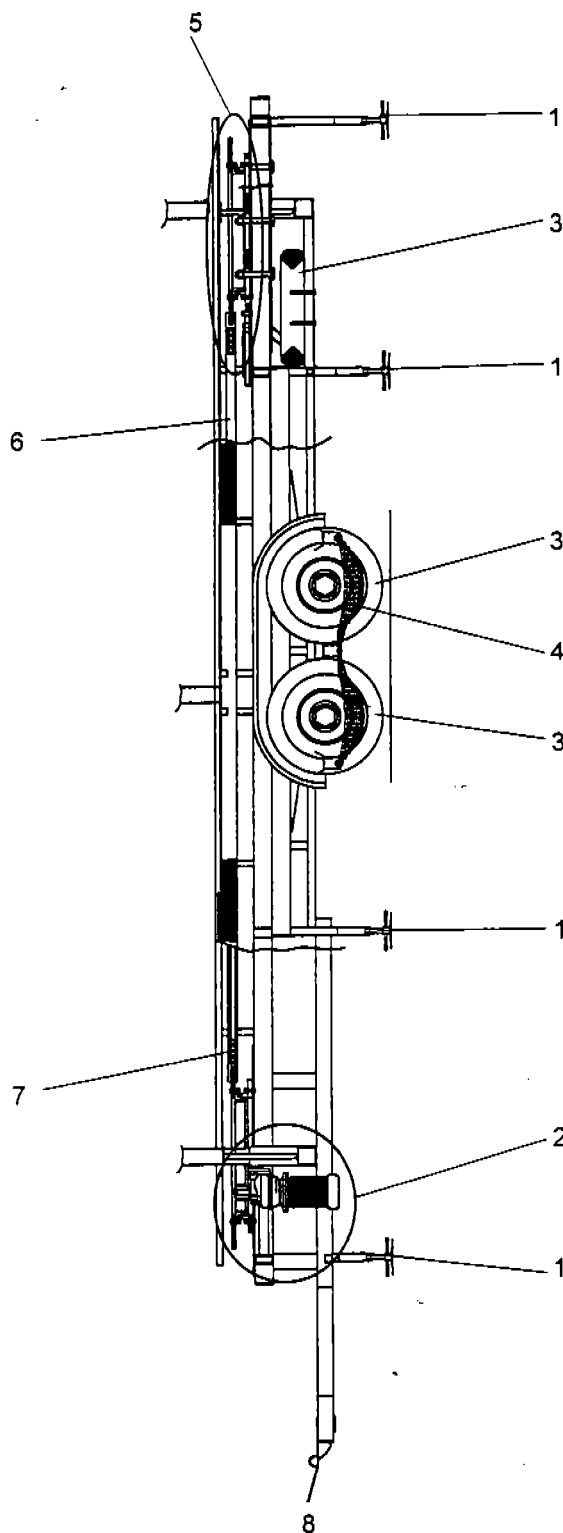
Il contatto presente tra i morsetti 2-3 dell'avviatore selezionano l'abilitazione al funzionamento dell'avviatore, mentre la non connessione tra i morsetti 1-3 selezionano la rampa n°1.

Pagina Bianca

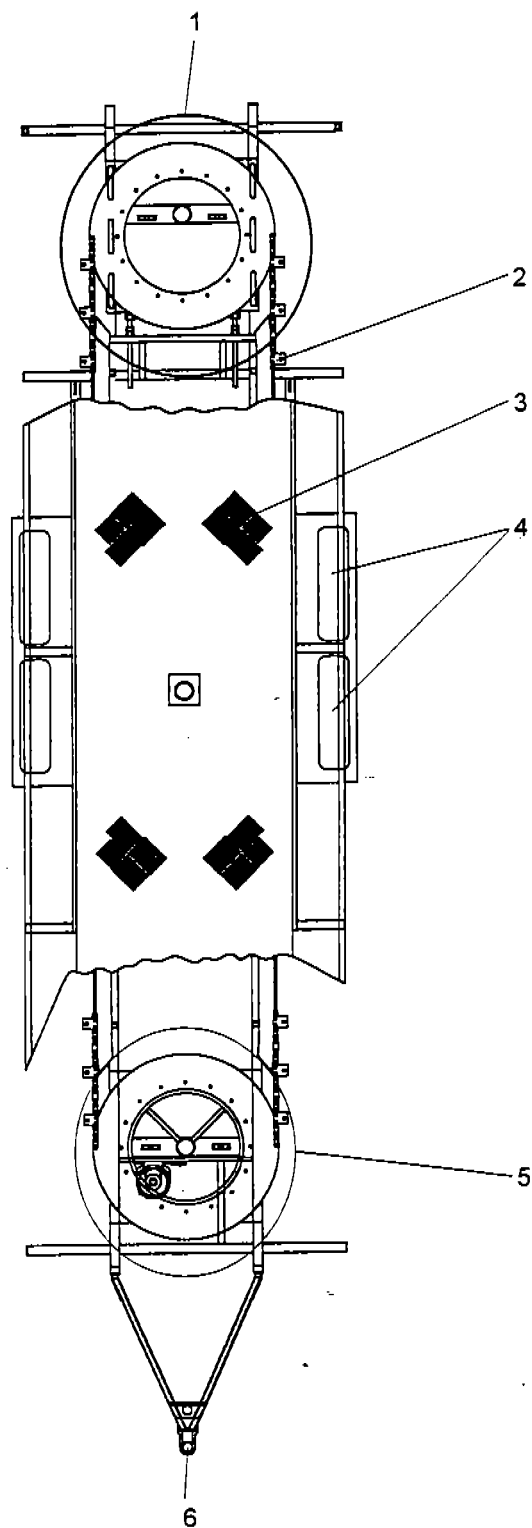
ZAMPERLA

SPARE PARTS CATALOGUE
CATALOGO RICAMBI

RIMORCHIO
TRAILER

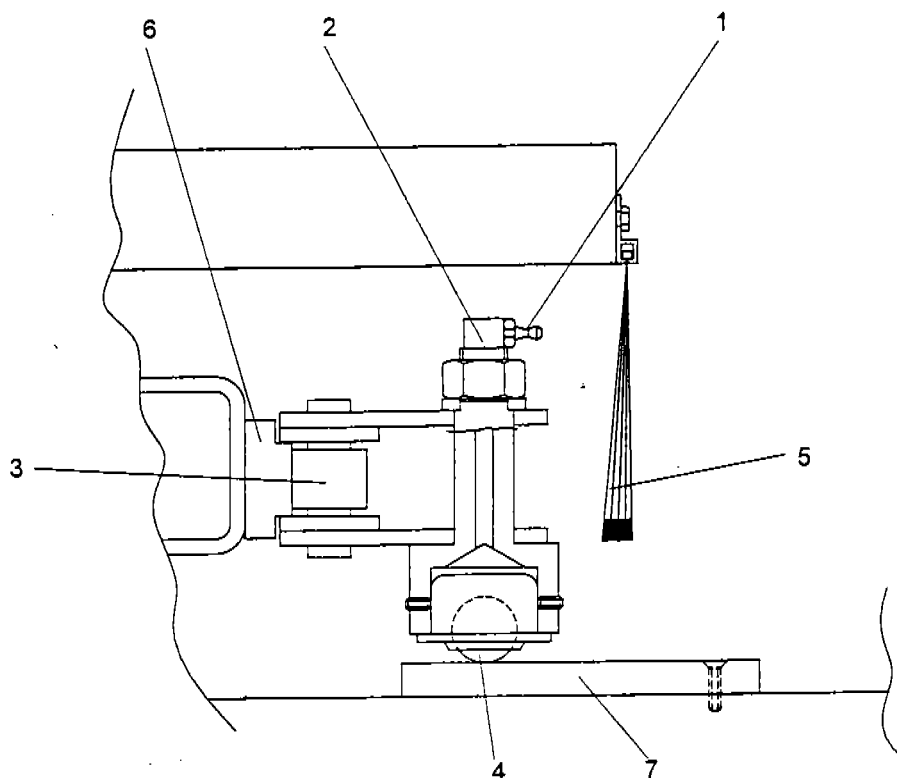


DESCRIPTION	CODE-CODICE	DESCRIZIONE
1- Base legs 2- Motorization group 3- Wheel 4- Leaf spring 5- Idle group 6- Chain slide 7- Chain 8- Trailer shaft		1- Piedino di appoggio 2- Gruppo motorizzazione 3- Ruota 4- Balestra 5- Gruppo folle 6- Patino scorrimento 7- Catena 8- Timone rimorchio

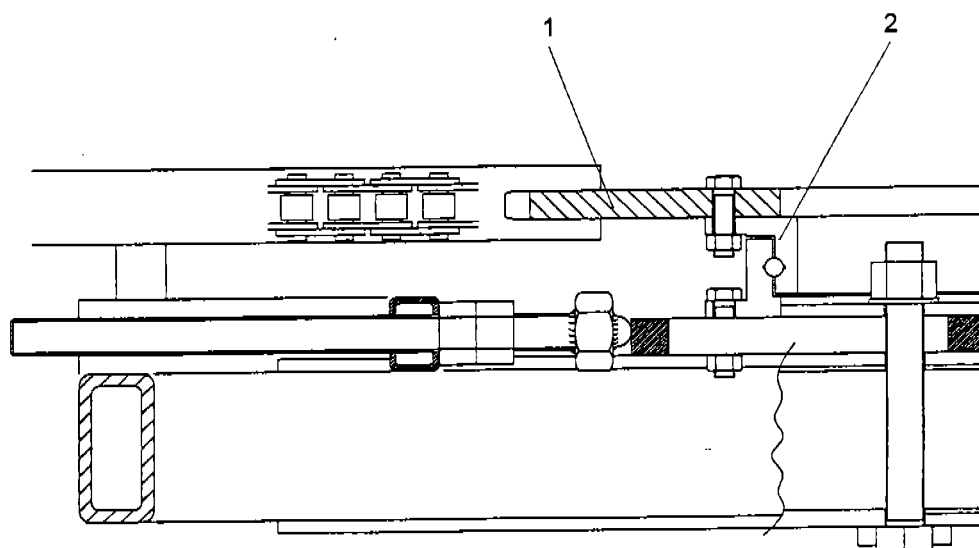


DESCRIPTION	CODE-CODICE	DESCRIZIONE
1- Idle group 2- Chain 3- Platform 4- Air tank 5- Motorization group 6- Trailer shaft		1- Gruppo folle 2- Catena 3- Pedane 4- Serbatoi aria 5- Gruppo motorizzazione 6- Timone

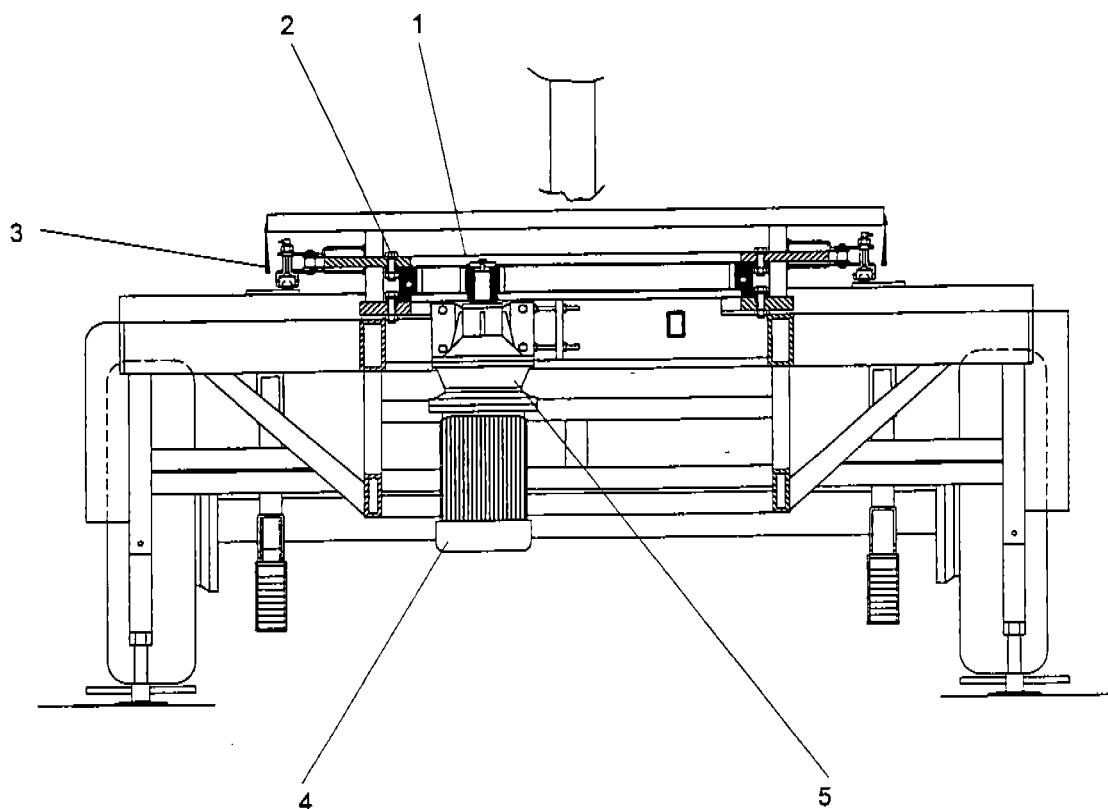
CATENA
CHAIN



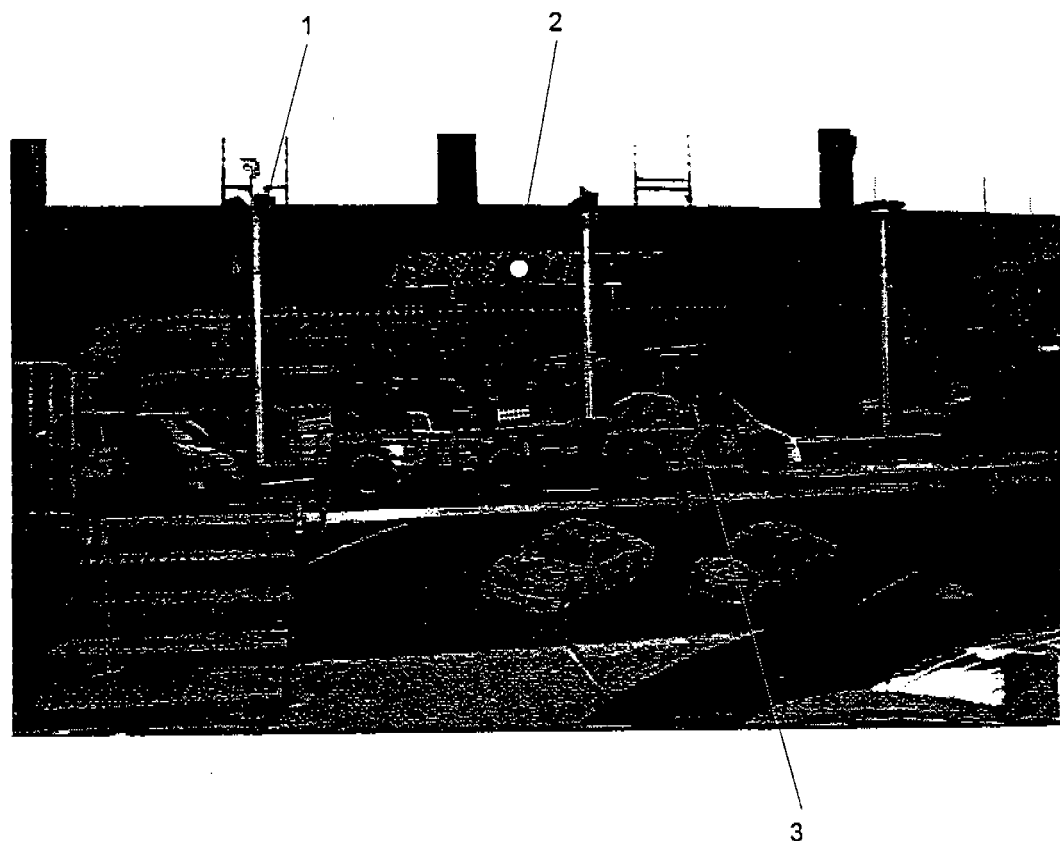
DESCRIPTION	CODE-CODICE	DESCRIZIONE
1- lubrication nipples 2- Junction 3- Conics roller chain 1" 1/2" 4- Rolling sfera SKF BTP 22 5- Nylon brush 6- Chain giude profile 7- Sphera base profile		1- Nipples lubrificazione 2- Raccordo 3- Catena a rulli conici 1" 1/2" 4- Sfera portante SKF BTP 22 5- Spazzola nylon 6- Profilo guida catena 7- Profilo appoggio sfera



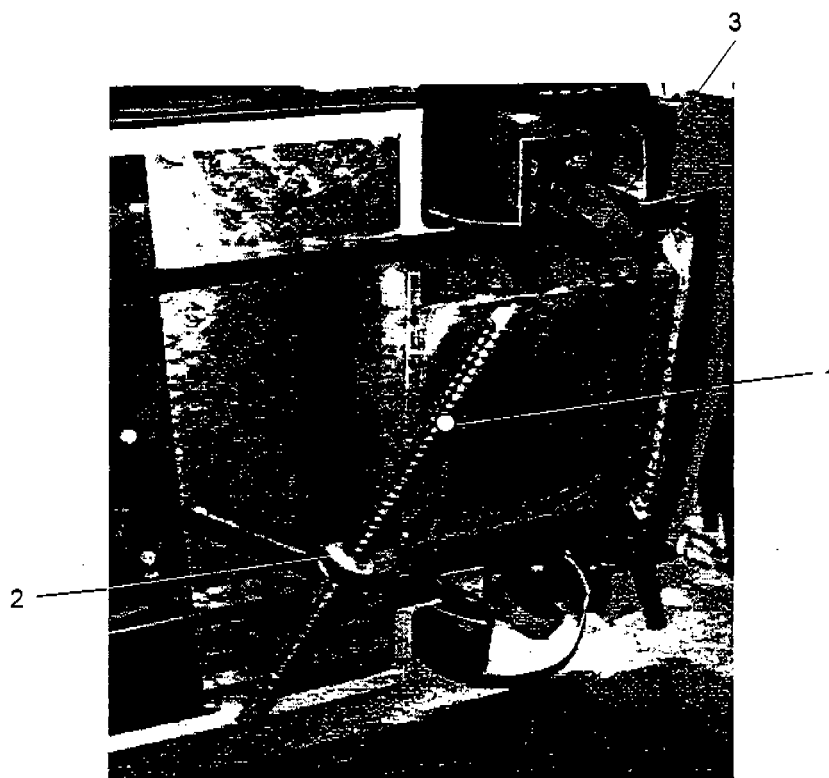
DESCRIPTION	CODE-CODICE	DESCRIZIONE
1- Crown gear P 1" 1/2" roller 25.4 2- Not toothed thrust bearing Rossi 1.088.250		1- Corona dentata P 1" 1/2" per rullo 25.4 2- Ralla senza dentatura Rossi 1.088.250



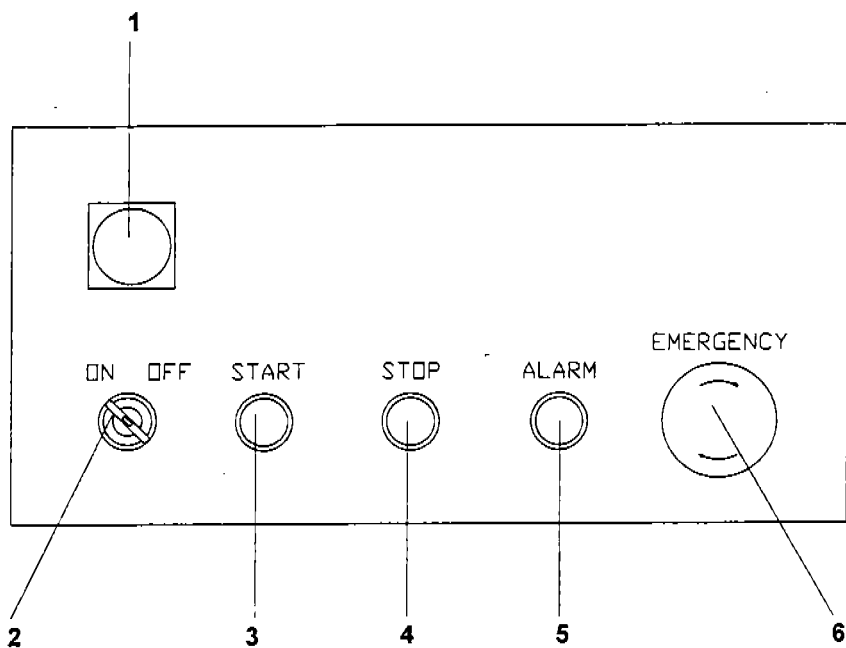
DESCRIPTION	CODE-CODICE	DESCRIZIONE
1- Pinion M6 a 50Hz Z 19/ a 60Hz Z17 2- Toothed thrust bearing Rossi I 1.088-250 3- Nylon brush 4- Electrical motor Siemens 4Kw 4poli B5 380/220V 5- Gear box Spargiani type RT63 1:12.5		1- Pignone M6 a 50Hz Z 19/ a 60Hz Z17 2- Ralla dentata Rossi I 1.088-250 3- Spazzola Nylon 4- Motore elettrico Siemens 4Kw 4poli B5 380/220V 5- Riduttore Spargiani tipo RT63 rapp 1:12.5



DESCRIPTION	CODE-CODICE	DESCRIZIONE
1- Alogen lights 2- "Speedway" print 3- Car 3a- External fiberglass 3b- Seat 3c- Safety belts 3d- Front glass 3e- Adhesive print (specify) 3f- Wheel		1- Fari alogeni 2- Scritta "Speedway" 3- Vettura 3a- Vetrotresina esterna 3b- Sedile 3c- Cinture di sicurezza 3d- Vetro anteriore 3e- Adesivi (specificare) 3f- Ruote

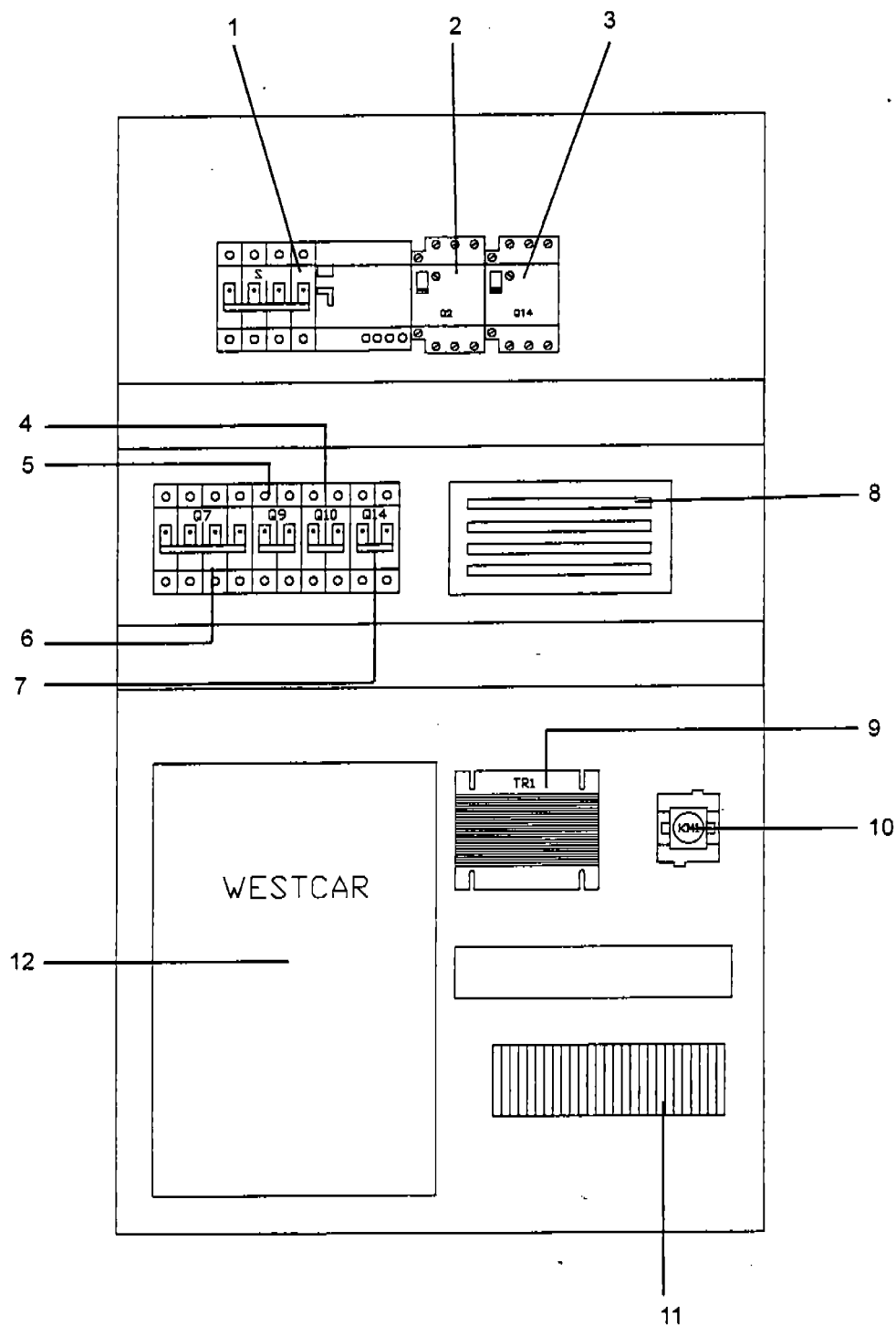


PULSANTIERA
PUSH BUTTON PANEL



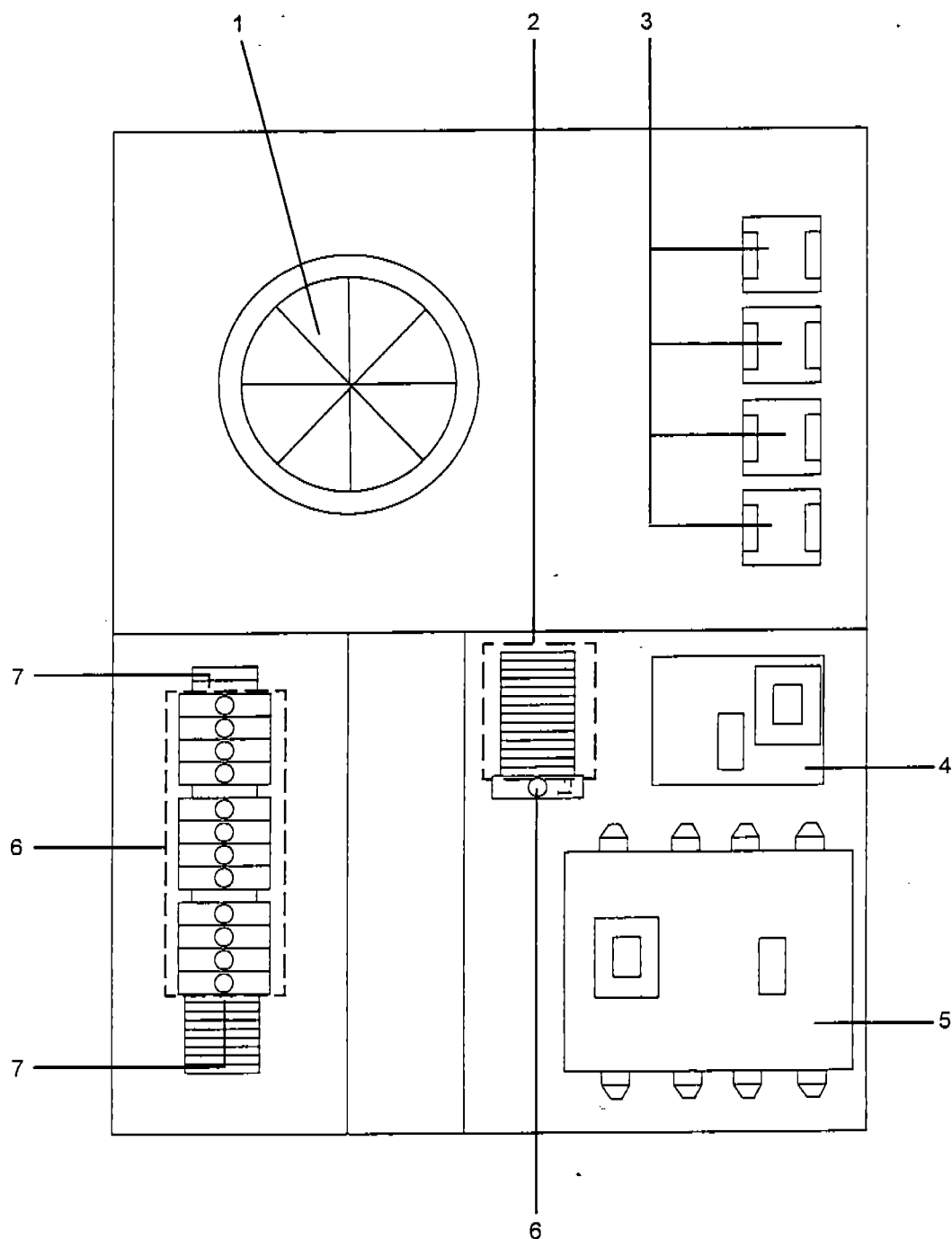
DESCRIPTION	CODE-CODICE	DESCRIZIONE
1- Timer 2- ON/OFF key 3- START button 4- STOP button 5- ALARM button 6- EMERGENCY button		1- Temporizzatore 2- Chiave ON/OFF 3- Pulsante START 4- Pulsante STOP 5- Pulsante avvisatore acustico 6- Fungo Emergenza

QUADRO ELETTRICO
ELECTRICAL BOARD

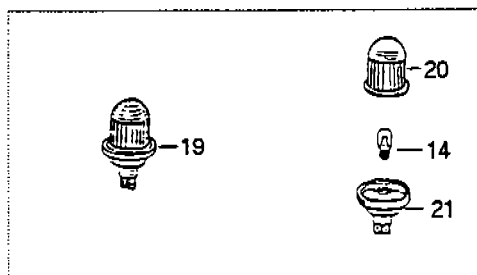


DESCRIPTION	CODE-CODICE	DESCRIZIONE
1- Earth leakage 4 poles switchTimer		1- Interruttore differenziale quadrip. 40A
2- Motor circuit breaker Siemens 10-16A		2- Salvamotore 10-16 A Siemens
3- Motor circuit breaker Siemens 0.6-1A		3- Salvamotore 0.6-1 A Siemens
4- Bipolar switch 16A		4- Interruttore magnet. bipolare 16A
5- Bipolar switch 16A		5- Interruttore magnet. bipolare 16A
6- 4 poles switch 16 A		6- Interruttore magnet. Quadrip. 16A
7- Bipolar switch 16A		7- Interruttore magnet. bipolare 16A
8- Connecting bars		8- Barrette di connessione
9- Transformer		9- Trasformatore 75 VA 0-110-220/0-24
10- Contactor+pneumatic timer		10- Contattore con temp. pneumatico
11- Cables clamp		11- Morsetti
12- Westar inverter		12- Inverter Westec

QUADRO ELETTRICO LUCI
LIGHTS ELECTRICAL BOARD



DESCRIPTION	CODE-CODICE	DESCRIZIONE
1- Acoustic alarm 2- Wires clamp 3- Crydon 4- Running lights 4 channel (220/110 V) 5- Running lights 4 channel (220/110 V) 6- Fuse holder + fuse 7- Wires clamp		1- Sirena 2- Morsetti 3- Crydon 4- Rincorsa luci 4 canali (220/110 V) 5- Rincorsa luci 8 canali (220/110V) 6- Portafusibile + fusibile 7- Morsetti



DESCRIPTION	CODE-CODICE	DESCRIZIONE
1- Cabochon series 100		1- Cabochon serie 100
2- Cap CA 0101		2- Calotta CA 0101
3- Base Ba 0101		3- Base BA 0101
4- Bulb (24V. 3Watt E14)		4- Lampada (24V. 3Watt E14)
4a- Bulb (60V. 8Watt E14)		4a- Lampada (60V. 8Watt E14)
4b- Bulb (110V. 3K. E14)		4b- Lampada (110V. 3K. E14)
4c- Bulb (220V. 3K. E14)		4c- Lampada (220V. 3K. E14)
5- Lamp holder (PL070)		5- Portalamcade (PL 070)
6- Connection RN 050		6- Rondella (RN 050)
7- Lamp holder (PL 071)		7- Portalamcade (PL 071)
8- Lamp holder (PL 090)		8- Portalamcade (PI 090)
9- Lamp holder (PL 091)		9- Portalamcade (PL 091)
10- Cabochon series 60		10- Cabochon serie 60
11- Cap CA 066		11- Calotta CA 066
12- Base BA 066		12- Base BA 066
13- Lamp holder PL099		13- Portalamcade PL 099
14- Bulb (24V. 3Watt E10)		14- Lampada (24V. 3Watt E10)
14a- Bulb (60V. 4Watt E10)		14a- Lampada (60V. 4Watt E10)
15- Light strip end		15- Terminale staggia
16- Light strip		16- Staggia
17- Cabochon series 10075		17- Cabochon serie 10075
18- Cap 10075		18- Calotta 10075
19- Cabochon series 10065		19- Cabochon serie 10065
20- Cap 10065		20- Calotta 10065
21- Lamp holder 10065		21- Portalamcade 10065

**LOGIC DIAGRAM
SCHEMA ELETTRICO**

SAFETY REQUIREMENTS

The key to safety is well trained and supervised employees. Make certain that all employees know how the ride operates. The employees should have a good attitude towards safety and common sense.

REMEMBER, SAFETY MUST ALWAYS COME BEFORE REVENUE.

Do not neglect the employees' safety. Before starting the ride, be certain there are no personnel inside the fences or on the ride structure. Be certain all electricity is turned off whenever an employee might come into contact with electrical connections or components.

GENERAL SAFETY GUIDELINES

The following is a list of a few general rules which should be adhered to by everyone. Remember that in the long run, the key to a safe and successful operation is to have well-trained and well-supervised employees.

1. All work must be done by competent, qualified mechanics capable of understanding the function of the parts and their proper installation.
2. Inspect the ride each day of operation to determine that no portion of the ride is damaged, omitted, or worn in such a manner that it is unsafe, or that unsafe conditions may develop.
3. Perform manufacturer's recommended maintenance procedures at intervals and in the manner specified by the Operation and Maintenance Manual, in the following general areas:
 - (a) Lubrication
 - (b) Electrical Systems
 - (c) Torquing of bolts
 - (d) Wear of bolted or pinned joints
 - (e) Adjustment and care of mechanical components
 - (f) Passenger securing devices
 - (g) All parts are present and installed
 - (h) Operating and emergency controls
 - (i) Factory installed safety devices

4. Study each job carefully to determine all hazards so that necessary safeguards can be taken.
5. Examine safety devices, tools, ladders, etc. before they are used to make sure they are in good condition.
6. Use the proper tool or equipment for each job. Ground all hand electric power tools before use unless the manufacturer advises otherwise.
7. Wear close fitting comfortable clothing when working on or close to mechanical apparatus or live electrical circuits. Avoid finger rings, jewelry, or other articles which may be caught in moving parts or come in contact with electrical circuits.
8. Protect your eyes by wearing approved safety glasses or goggles.
9. Where work is to be performed is hazardous, such as live electrical circuits, at least two men should work together.
10. If guards must be removed from equipment, make sure they are replaced before leaving the job.
11. Clean up each job and dispose of surplus materials.
12. Keep a record of parts replaced and date of replacement. Inform the manufacturer of any replacement requirements that are frequent or cause unsafe conditions.
13. Make modifications and additions as outlined in the manufacturer's Service and Safety Bulletins.

OPERATOR RESPONSIBILITIES

1. **HANDICAPPED PERSONS** - Persons who are physically handicapped must not be allowed to ride violent or fast moving rides. If the management of the amusement area allow handicapped to ride certain slow rides, the operator must ensure that the handicapped person is under the full control of an adult person who will ride with them and provide supervision during the ride or will not be injured while riding the ride.
2. **PROHIBITED PASSENGERS** - Operators shall not allow a passenger on the ride who cannot be properly secured due to his size or if there is a malfunction to the securing device. Similarly, they must refuse service to a pregnant woman, or a passenger who is visibly ill, or under the influence of alcohol or drugs.
3. **CLEARANCE PRECAUTION** - Before operating the ride, it is important to ensure that there are no personnel around the ride structure or any exposed electrical components or other areas where there could be a risk of injury.
4. **ON-DUTY ATTENTION** - Insist that each operator remain in full control of the operating controls during operation of the ride with complete attention to the ride and passengers. Under no circumstances should the operator leave his or her position while the ride is in operation.

If it does become necessary for the operator to leave his post at the controls, he must turn the ride off completely to ensure it does not accidentally start and injure passengers or staff.
5. **INSPECTION/CHECK LIST** - Operators must inspect the ride and complete a General Check List before each day's operation.
6. **DAILY WARM-UP** - The operator must always run the ride through several cycles before the first passengers are loaded. This warm-up without passengers is necessary to make sure the ride is safe and there are no problems mechanically not detected previously.

7. **PRECAUTIONS BEFORE AND DURING THE RIDE** - Never start the ride unless the operator or assistant is facing the ride and is in a position to observe the whole are because:
 - Patrons have been known to jump fences.
 - Patrons have been known to try to change positions while the ride is running.
 - Patrons have been known to "skylark" causing their own safety and that of others to be put in jeopardy.
 - The operator's assistant may wish to make a last minute adjustment and be put in a dangerous position when the operator puts the ride in motion.
8. **SMOKING** - Smoking is not allowed on the Miner Mike. This includes the operator as well as the passengers.
9. **LOOSE ITEMS** - The area inside the Miner Mike must be clear of any items that can fly out to the edge of the ride when it gets up to speed.
10. **FOOD AND DRINK** - It is recommended that no food or drink be allowed onto the ride.

OPERATOR SELECTION AND INSTRUCTION

1. Select competent, mature operators, capable of understanding the function and use of amusement rides and their control.
2. Instruct each operator fully in the proper use and function of the ride he is to supervise, including:
 - (a) Controls and procedures for normal and emergency operation.
 - (b) Manufacturer's recommended maximum speed and load.
 - (c) Manufacturer's recommended length of ride time and frequency of repeat rides.
 - (d) Any foreseeable misuse of the ride as determined by the manufacturer or owner, or by special conditions such as weather, location, or crowds.
 - (e) Each operator must have immediate availability of a manufacturer's Operator Manual for the ride he supervises.
3. Require each operator to inspect the ride he supervises, each day of the operation.
 - (a) Determine that no portion of the ride is damaged, omitted or worn in such a manner that it is unsafe or that it may develop into an unsafe condition.
 - (b) Report any irregularities to the superintendent or owner.
 - (c) Do not operate the ride if any irregularities are found until such condition has been corrected.
4. Instruct the operator to allow no passengers to ride who are visibly ill, or under the influence of drugs or alcohol.
5. Instruct operators and attendants on the proper methods of securing passengers in the ride. Do not allow a passenger to board a ride if he cannot be properly secured because of his size or because there is a malfunction of the securing device.

STOP the ride immediately if any passenger is observed moving from their seat, turning upside down, or behaving dangerously, such as standing up.

6. Advise the operator against starting or operating the ride while any person (passenger, spectator, or employee) is in an endangered or unsafe position on the ride, or within the ride area.
7. Insist that each operator remain in full control of the operating controls during operation of the ride, and gives his full attention to the ride and its passengers.
8. Instruct the operator to let no other person, other than another trained operator, operate the controls of the ride, except those portions of the ride that are specifically designed to be controlled by the passenger.
9. Advise the operator that factory-installed safety devices are not to be tampered with or removed.
10. Advise the operator of owner/supervisor procedures for assisting ill or injured passengers.
11. Instruct operators and attendants that patrons are required to secure all articles, such as keys, change, eye glasses, etc., which may become loose while riding.

REPLACEMENT OF BOLTS

During normal maintenance practices, it is necessary to replace some bolts. They work loose because they have not been checked periodically, or they become lost when they are removed to repair some component. The points we wish to stress are the following:

Wisdom Industries uses only grade 5 bolts or better.

Bolts are identified by markings on the bolt head. Bolts without markings are generally grade 2 or 3 (common hardware store variety) and are not strong enough to be used on amusement rides in high stress areas.

When replacing any bolt, always use an equivalent or stronger bolt. Higher numbers mean stronger bolts.

NOTE: There are some bolts available above grade 8; however, these bolts are not to be used for general purposes. They are extremely brittle and are designed for special applications.

If trouble is encountered with bolts working loose, check the tightness according to the torque chart.

If certain bolts continue to work loose, remove the bolts and inspect the threaded holes. If threads are in good condition, clean the hole out with a non-oil base solvent and blow dry and apply "loctite" to the threads. After doing this, install new washer and bolt and torque as per the chart.

BOLT TENSIONING TORQUE

1. All tensioning pressures are for grade 5 bolts which have a tensile strength of 50 tons per square inch.
2. Bolts that are used continuously for portable ride erection should not be tensioned to maximum torque unless instructed to do so or they are in a high stress area.

3. Bolts tensioned to maximum torque should not be continuously reused and should be replaced with new bolts of equivalent strength.
4. Caution should be exercised in applying torque because in some cases, it may not be possible to utilize all the torque a bolt will stand because of distorting surrounding parts.
5. Lubricate bolts when using with SAE 30 oil or an approved anti-sieze compound.

CAUTION: Torque values are given for steel bolts and steel nuts screwed into threaded holes in steel. Be certain threaded parts are not aluminum, brass, or other soft alloys.

BOLT TORQUE CHART

Bolt Size Recommended Grade 5	Max Torque	Recommended	
		Torque Reusable Bolt	Torque Permanent Bolt
U.N.C.	ft. lbs.	ft. lbs.	ft. lbs.
3/8	27	24	26-28
1/2	66	55	60-66
5/8	130	95	125-130
3/4	230	180	220-230
7/8	370	290	360-370
1	560	480	540-560

Maximum torque listed is 65% proof load of bolt

NOTE: It is important to note the necessity of lightly oiling bolt before use as outlined above.

PNEUMATIC TIRES ON AMUSEMENT DEVICES AND SUPPORT VEHICLES

- * It is strongly recommended to carry a quality spare tire and wheel for every type you have in operation, and inflated to pressure.
- * Check pressures regularly on all tires in operation and maintain to manufacturer's recommendations.
- * Unless unavoidable, it is strongly recommended that repairs or the fitting of new tires to rims be carried out by experts at recognized tire dealers using correct equipment.

******CAUTION******

Respect the potential power and explosive force of air under pressure. Serious accidents have resulted from lack of awareness of the explosive potential of compressed air. Respect it as you would DYNAMITE.

The following pages of guidelines, safety precautions and procedures of tire changing are included to make all operators aware of the dangers that can be encountered by neglecting care and safety in handling tires and compressed air.

TIRE SAFETY - MOUNTING/DEMOUNTING

The following guidelines and safety procedures are intended to be used for reference only. Procedures will vary for different tire mount equipment and different types of rims. If at any time an uncertainty exists about the method of assembly or component parts or use of equipment, consult specific equipment manuals.

The following precautions apply generally for all types of tires. In addition, each section emphasizes specific precautions for each particular type of tire.

*****WARNING*****

FAILURE TO OBSERVE THE PRECAUTIONS OUTLINED IN THIS SECTION MAY RESULT IN FAULTY POSITIONING OF THE TIRE AND/OR RIM PARTS, CAUSING THE ASSEMBLY TO BURST WITH EXPLOSIVE FORCE SUFFICIENT TO CAUSE SERIOUS PHYSICAL INJURY OR DEATH.

CORRECT PROCEDURES - DO it this way.

1. Make sure that all rims are in good condition for use - not damaged, dented, or deformed.
2. Remove valve core and exhaust all air from the tire (or tires in the case of a dual assembly) before demounting. Probe the valve stem with a wire as a final check to make sure the valve is not plugged. Do not stand in front of a valve opening as dirt particles may be blown into your eyes.
3. Block vehicle in a positive manner so it cannot roll forward or backward after it is jacked up.
4. Place large hardwood blocks under the jack, regardless of how hard or firm the ground appears.
5. Place safety jacks, or crib up with blocks at an appropriate place under the vehicle, in case the jack slips.

2. Don't loosen lug nuts on duals until all air is exhausted from both tires. A broken or cracked rim part under pressure could blow apart and seriously injure or kill if lugs are removed before air is exhausted.
3. Don't ever apply heat or do repair work on an inflated tire, rim, and wheel assembly. Heat can increase air pressure to a level sufficient to burst the tire or rim.
4. Don't reinflate a tire that has been run flat or seriously under-inflated without demounting the tire and checking the tire and tube for damage.
5. Don't mix rim parts of different manufacturers unless such use is approved by those manufacturers.
6. Don't attempt, under any circumstances, to rework, weld, heat, or braze rim parts. Replace damaged parts with the same size, type, and make.
7. Don't reuse tubes or flaps that have buckled or creased.
8. Don't use a tube in a tire larger or smaller than that for which the tube was designed.
9. Don't inflate beyond recommended bead seating pressure. Don't stand over tire when inflating.
10. Don't transport fully inflated tires mounted on multi-piece rims. Inflate only enough (10-15 PSI) to keep rim parts in place. Inflate tires to correct operating pressure only after tire and rim assembly have been fastened in place, all lug nuts properly torqued, and rim parts rechecked for proper fit.
11. Do not substitute petroleum based lubricants, silicon or anti-freeze for approved rubber lubricants.

Parts Replacement Manual

For

DODGE® TORQUE-ARM™

Speed Reducers

Straight Bore & Taper Bushed

SIZES: TXT 109 — ~~TXT 119~~ — TXT125
TXT 209 — TXT215 — TXT225

WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Reliance Electric Industrial Company nor are the responsibility of Reliance Electric Industrial Company. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.

DODGE / P.O. Box 499 / 6040 Ponders Ct. / Greenville, South Carolina 29602-0499 / 803-297-4800

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**RELIANCE
ELECTRIC**

Printed in U.S.A.

Instruction Manual 499839

8/93 3M-K

INSTALLATION

1. Use eyeboots to lift reducer.
2. Determine the running positions of the reducer. (See Fig. 1) Note that the reducer is supplied with either 4 or 7 plugs: 4 around the sides for horizontal installations and 1 on each face for vertical installations. These plugs must be arranged relative to the running positions as follows:

Horizontal Installations — Install the magnetic drain plug in the hole closest to the bottom of the reducer. Throw away the tape that covers the filler/ventilation plug in shipment and install plug in topmost hole. Of the 3 remaining plugs on the sides of the reducer, the lowest one is the minimum oil level plug.

Vertical Installations — Install the filler/ventilation plug in the hole provided in the top face of the reducer housing. Use the hole in the bottom face for the magnetic drain plug. Of the 3 remaining holes on the sides of the reducer, use a plug in the upper housing half for the minimum oil level plug.

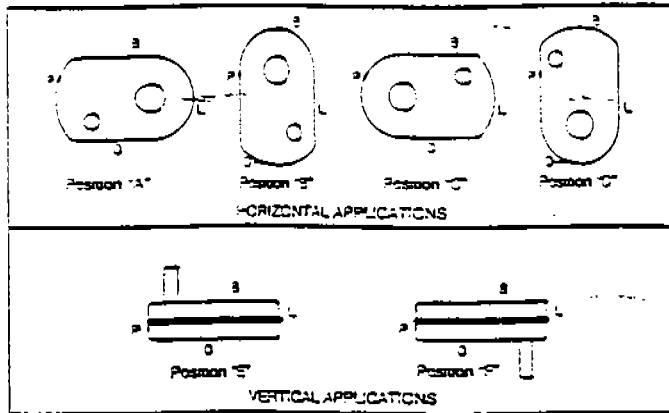


Fig. 1 — Mounting Positions

The running position of the reducer in a horizontal application is not limited to the four positions shown in Figure 1. However, if running position is over 20° either way from sketches, the oil level plug cannot be used safely to check the oil level, unless during the checking the torque arm is disconnected and the reducer is swung to within 20° of the positions shown in Figure 1. Because of the many possible positions of the reducer, it may be necessary or desirable to make special adaptations using the lubrication fitting holes furnished along with other standard pipe fittings, stand pipes and oil level gauges as required.

Mount reducer on driven shaft as follows:

WARNING

To ensure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.

For Straight Bore: Mount reducer on driven shaft as close to bearing as practical. If bushings are used, assemble bushings in reducer first. A set of bushings for one reducer consists of one keyseated bushing and one plain bushing. Extra length setscrews are furnished with the reducer. Driven shaft should extend through full length of speed reducer. Tighten both set-screws in each collar.

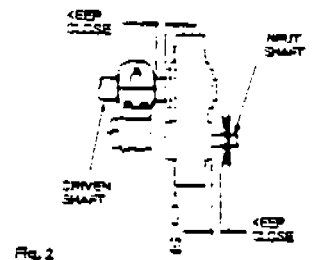


Fig. 2

For Taper Bushed: Mount reducer on driven shaft per instruction sheet No. 499629 packed with tapered bushings.

1. Install sneave on input shaft as close to reducer as practical. (See Fig. 2).

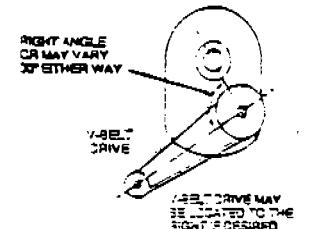


Fig. 3

3. Install motor and V-belt drive so belt will approximately be at right angles to the center line between driven and input shaft. (See Fig. 3) This will permit tightening the V-belt with the torque arm.

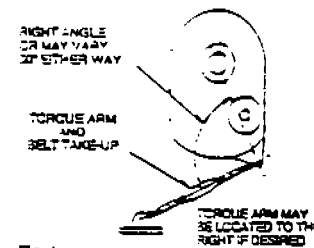


Fig. 4

6. Install torque arm and adaptor plates using the long reducer bolts. The bolts may be shifted to any of the holes on the input end of the reducer.

7. Install torque arm fulcrum on a rigid support so that the torque arm will be approximately at right angles to the center line through the driven shaft and the torque arm anchor screw. (See Fig. 4) Make sure that there is sufficient take-up in the turnbuckle for belt tension adjustment when using V-belt drive.

CAUTION: Unit is shipped without oil. Add proper amount of recommended lubricant before operating. Failure to observe this precaution could result in damage to, or destruction of the equipment.

8. Fill gear reducer with recommended lubricant.

LUBRICATION

Important: Because reducer is shipped without oil, it is necessary to add the proper amount of oil before running. Use a high-grade petroleum-base, rust and oxidation inhibited (R&O) gear oil — see tables. Follow instructions on reducer nameplate, warning tags, and in the installation manual.

Under average industrial operating conditions, the lubricant should be changed every 2500 hours of operation or every 6 months, whichever occurs first. Drain reducer and flush with kerosene, clean magnetic drain plug and refill to proper level with new lubricant.

CAUTION: Extreme pressure (EP) lubricants are not recommended for average operating conditions. Failure to observe these precautions could result in bodily injury.

CAUTION: Too much oil will cause overheating and too little will result in gear failure. Check oil level regularly. Failure to observe this precaution could result in bodily injury.

Under extreme operating conditions, such as rapid rise and fall of temperature, dust, dirt, chemical particles, chemical fumes, or oil sump temperatures above 200°F., the oil should be changed every 1 to 3 months depending on severity of conditions.

CAUTION: Do not use EP oils or oils containing slippery additives such as graphite or molybdenum disulphide in the reducer when backstop is used. These additives will destroy sprag action.

Table 1 — Oil Volumes

Reducer Size	Volume of Oil Required to Fill Reducer to Oil Level Plug																	
	Position A			Position d			Position C			Position D			Position E			Position F		
	Fluid Ounces (Approx.)	Quarts* (Approx.)	Liters (Approx.)	Fluid Ounces (Approx.)	Quarts* (Approx.)	Liters (Approx.)	Fluid Ounces (Approx.)	Quarts* (Approx.)	Liters (Approx.)	Fluid Ounces (Approx.)	Quarts* (Approx.)	Liters (Approx.)	Fluid Ounces (Approx.)	Quarts* (Approx.)	Liters (Approx.)	Fluid Ounces (Approx.)	Quarts* (Approx.)	Liters (Approx.)
TXT103																		
TXT115	16	1	.47	16	1	.47	20	1	.53	24	1	.63	32	1	.85	40	1 1/4	1.19
TXT125																		
TXT203																		
TXT215	28	1	.83	32	1	.95	30	1	.89	32	1	.95	32	1 1/4	1.54	36	1 1/4	1.55
TXT225																		

† Refer to Fig. 1 on page 2 for mounting positions.

* U.S. Measure: 1 quart = 32 fluid ounces = .94646 liters.

Notes: If reducer position is to vary from those shown in Figure 1 either more or less oil may be required. Consult factory.

Table 2 — Oil Recommendations for Average Operating Conditions

Ratio and Output RPM	Ambient Temp °F/°C	Viscosity				Oil	
		ISC VG	AGMA	ASTM SUS @ 100°F	Metric Equip C St. @ 40°C	Preferred	Alternate
						SAE Gear	SAE
25:1 up to 45 RPM 15:1 up to 75 RPM 9:1 up to 120 RPM	-25° thru 15°	68	2	285-350	60-75	90W	20
	15° thru 50°	100	3	417-510	90-120	35W	30
	50° thru 125°	150	4	525-765	125-165	90	40
25:1 48 RPM and up 15:1 75 RPM and up 9:1 121 RPM and up	-25° thru 15°	68	2	285-350	60-75	90W	20
	15° thru 50°	150	4	525-765	125-165	90	40
	50° thru 125°	220	5	918-1122	198-242	90	50

*Optional — MOBIL SHC 325 or 627 (Synthetic)

Notes: Automotive oil should be non-detergent

MOTOR MOUNTS

The motor mount must be installed on output end of reducer as shown in Figure 5.

Note: the T-A M motor mount is not recommended for applications requiring the use of TRI-MATIC® overcad release.

Remove two or three (as required) housing bolts on output end of reducer. Place the motor mount in position and install the longer housing bolts supplied with the motor mount. Tighten bolts to torque specified in Table 3.

Install motor, drive sheave and driven sheave so that driven sheave is as close to the reducer housing as practical. Install V-belt and tension with the four adjusting screws provided on T-A M motor mount.

Check all bolts to see that they are securely tightened.

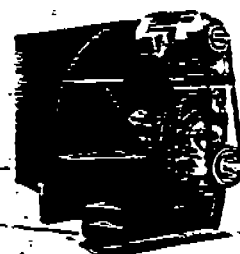


Fig. 5 NOTE: Belt guard removed for photographic purposes.
Warning: Do not operate if belt guard is not in place.

GUIDELINES FOR TORQUE-ARM REDUCER LONG-TERM STORAGE

During periods of long storage, or when waiting for delivery or installation of other equipment, special care should be taken to protect a gear reducer to have it ready to be in the best condition when placed into service.

By taking special precautions, problems such as seal leakage and reducer failure due to the lack of lubrication, improper lubrication quantity, or contamination can be avoided. The following precautions will protect gear reducers during periods of extended storage:

Preparation

1. Drain the oil from the unit. Add a vapor phase corrosion inhibiting oil (VCI-105 oil by Daubert Chemical Co.) in accordance with Table 3.
2. Seal the unit air tight. Replace the vent plug with a standard pipe plug and wire the vent to the unit.
3. Cover the shaft extension with a waxy rust preventative compound that will keep oxygen away from the bare metal. (Non-Rust X-110 by Daubert Chemical Co.)
4. The instruction manuals and lubrication tags are paper and must be kept dry. Either remove these documents and store them inside or cover the unit with a durable waterproof cover which can keep moisture away.

5. Protect the reducer from dust, moisture, and other contaminants by storing the unit in a dry area.

6. In damp environments, the reducer should be packed inside moisture-proof container or an envelope of polyethylene containing a desiccant material. If the reducer is to be stored outdoors, cover the entire exterior with a rust preventative.

When placing the reducer into service

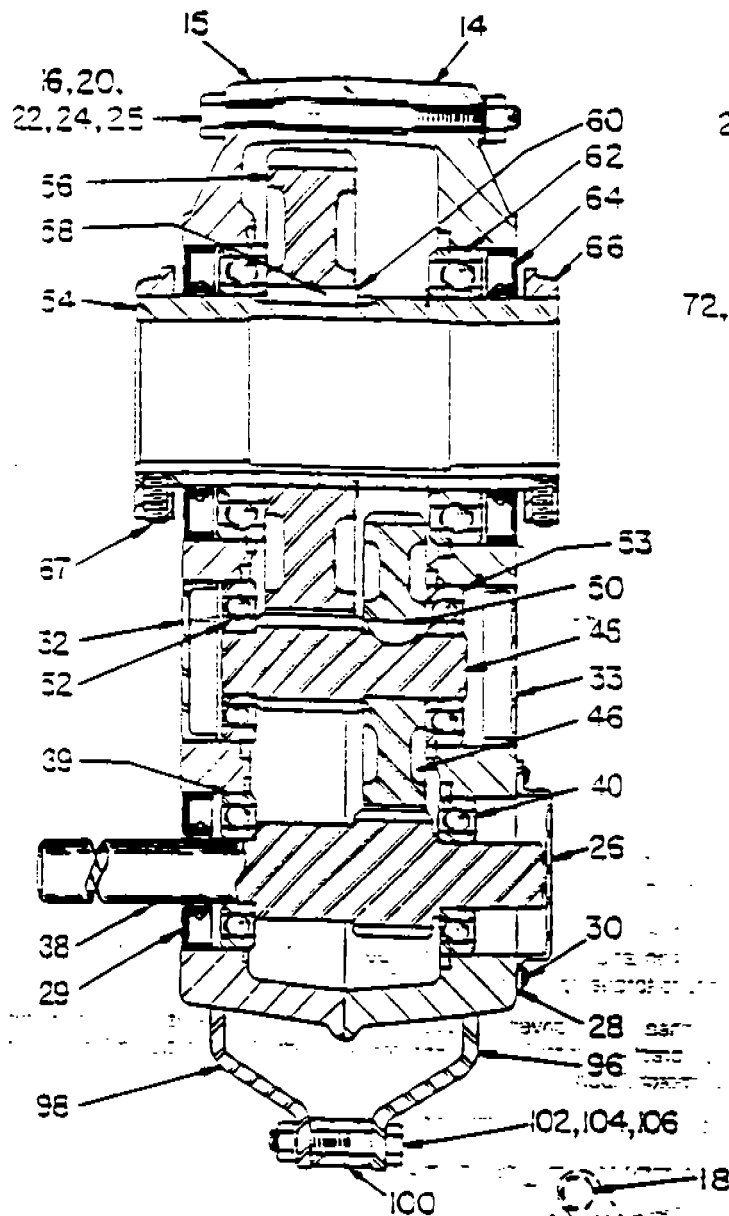
1. Assemble the vent plug into the proper hole.
2. Clean the shaft extensions with petroleum solvents.
3. Fill the unit to the proper oil level using a recommended lubricant. The VCI oil will not affect the new lubricant.
4. Follow the installation instructions provided in this manual.

**Table 3 — Quantities of VCI #105 Oil
DODGE part number 415112-80-DB**

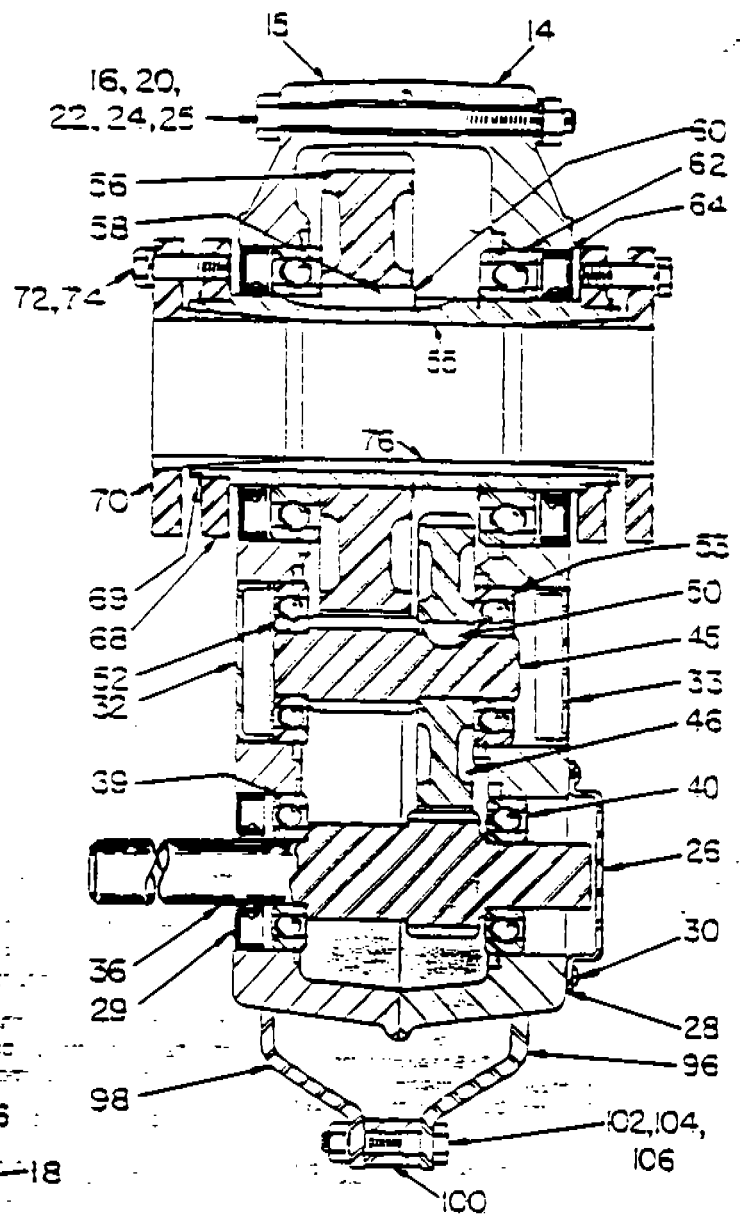
Case Size	Quarts or Liters
TXT1 & TXT2	1

VCI #105 & #10 are interchangeable.
VCI #105 is more readily available.

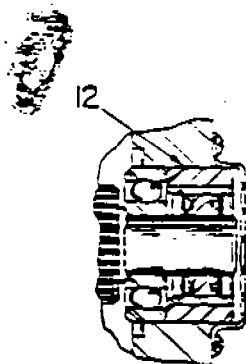
**PARTS FOR TXT1 thru TXT2 STRAIGHT BORE & TAPER BUSHED
SPEED REDUCERS**



Straight Bore

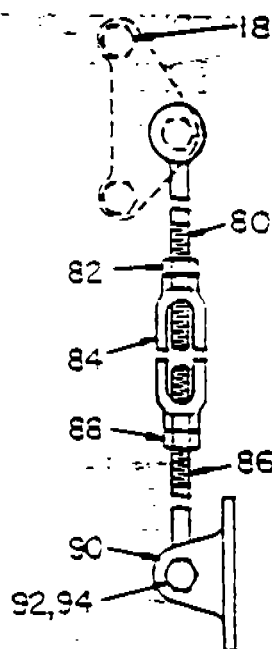


Taper - Bushed



Backstop Assembly

Note: The two-digit numbers are for reference only. Order parts by the six-digit numbers in the Parts List. Each six-digit number is a complete identification of the part or assembly.



Torque-Arm Assembly

Reference	Name of Part	No. Rec'd	1911	1912
			Part No.	Part No.
12	Backstop Assembly	1	242101	252101
14	Housing	1	241190	242190
15	Air Vent	1	241237	241237
16	Housing Bolt	2	411418	411418
17	Adapter — Housing Bolt	2	411420	411420
18	Lockwasher	1	419011	419011
19	Hex Nut	2	407087	407087
20	Power Pin	2	420091	420091
21	Pipe Plug	2	430031	430031
22	Magnetic Plug	1	430060	430060
23	Washer	1	419092	419204
24	Backstop Cover	1	242221	243221
25	Backstop Cover Screw	4	415022	415022
26	Lockwasher	1		
27	O. Shaft Brg. Cover (Input)	1	242224	242212
28	O. Shaft Brg. Cover (Backstop)	1	242224	243224
29	Input Shaft with Pinion	3:1 Ratio	241481	242481
30		15:1 Ratio	241302	242186
31		25:1 Ratio	241200	242187
32	Input Shaft Key		443008	443014
33	COUNTER-SHAFT ASSEMBLY *	3:1 Ratio	392100	392101
34		15:1 Ratio	392090	392092
35		25:1 Ratio	392091	392093
36	Δ Countershaft With Pinion —			
37	Δ First Reduction Gear	3:1 Ratio	241219	242185
38		15:1 Ratio	241482	242482
39		25:1 Ratio	241170	242008
40	Δ Gear Key		241171	242005
41			241309	242218
42	OUTPUT HUB ASSEMBLY*			
43	Straight Bore	1	390151	392110
44	Taper Bushed Δ Output Hub (Str. Bore)	1	390873	392111
45	Δ Output Hub (Taper Bush)	1	241208	242208
46	Δ Output Gear	1	241255	242134
47	Δ Output Gear Key	1	241007	242181
48	Δ Output Hub Snap Ring	1	241217	443399
49	Output Hub Key C (Max. Bore)	2	421013	421017
50		1	241298	242298
51	Output Hub Collar	2	241209	242209
52	Collar Screw C	4	400062	400094
53	Bushing Back-up Plate	2	241256	242137
54	Retaining Ring	2	421111	421112
55	SEAL KIT*	1	392119	392120
56	Δ Backstop Cover Gasket	1	242223	243223
57	Δ Input Shaft Seal	1	241457	242211
58	Δ Output Hub Seal	2	241210	242210
59	Gasket Eliminator Tube	1	465044	465044
60	BEARING KIT*	1	389905	389908
61	Δ Input Shaft Brg (Input)	1	424112	424019
62	Δ Input Shaft Brg (Backstop)	1	424111	424090
63	Δ Countershaft Brg	2	424006	424000
64	Δ Output Brg	2	424020	424022

Reference	Name of Part	No. Rec'd	TXT1	TXT2
			Part No.	Part No.
70	BUSHING ASSEMBLY* (Taper Bushed Only)	1" Bore 1 1/4" Bore 1 1/2" Bore 1 3/4" Bore 1 1/2" Bore 1 3/4" Bore 1 1/2" Bore 1 3/4" Bore 1 1/2" Bore 1 3/4" Bore 1 1/2" Bore 1 3/4" Bore	241278 241280 241282 241288 241288 241290 241294 241292 — — — —	— — 242148 242148 242150 242152 242154 242155 242153 242162 242164 242166 242168
72	Δ Bushing Screw	6	411405	411390
74	Δ Lockwasher	6	419010	419010
75	Δ Key Bushing to Shaft	1" Bore 1 1/4" Bore 1 1/2" Bore 1 3/4" Bore 1 1/2" Bore 1 3/4" Bore 1 1/2" Bore 1 3/4" Bore 1 1/2" Bore 1 3/4" Bore 1 1/2" Bore 1 3/4" Bore	443274 443274 443274 241308 241307 241306 241310 241305 — — — —	— — 443281 443281 443281 443284 443280 443292 443292 242172 242171 242170 — 443283
8	Δ Key Bushing to Output Hub	1" Bore 1 1/4" Bore 1 1/2" Bore 1 3/4" Bore	— — — —	443294
8	Δ Key Bushing to Output Hub	1" Bore 1 1/4" Bore 1 1/2" Bore 1 3/4" Bore	443272 443272 443272 443272	— — — —
80	TORQUE ARM ASSEMBLY*			
81	Δ Rod End	1	241097	243097
82	Δ Hex Nut	1	241245	243245
84	Δ Turnbuckle	1	407093	407095
86	Δ Extension	1	241246	243246
88	Δ L.H. Hex Nut	1	241247	243247
90	Δ Fulcrum	1	407242	407244
92	Δ Fulcrum Screw	1	241249	243249
94	Δ Hex Nut	1	411456	411484
96	ADAPTER ASSEMBLY*	1	407091	407093
98	Δ R.H. Adapter Plate	1	259151	259152
100	Δ L.H. Adapter Plate	1	241242	242136
102	Δ Adapter Bushing	1	241241	242135
104	Δ Adapter Bolt	1	242243	243243
106	Δ Lockwasher	1	411412	411437
108	Δ Hex Nut	1	419011	419012
110		1	407087	407089

* Includes parts listed immediately below marked "Δ". Bushing assembly includes 2 bushings.

Δ The parts marked "Δ" make up the assemblies under which they are listed.

8 Not shown on drawing.

† 4 rec'd. on TXT1; 5 rec'd. on TXT2.

‡ 5 rec'd. on TXT1; 7 rec'd. on TXT2.

□ Straight Bore only.

■ Taper Bushed only.

On Size TXT2 for 1 1/2" thru 1 3/4" bores.

REPLACEMENT OF PARTS

IMPORTANT:

Using tools normally found in a maintenance department, a CODGE TORQUE-ARM speed reducer can be disassembled and reassembled by careful attention to the instructions following.

Cleanliness is very important to prevent the introduction of dirt into the bearings and other parts of the reducer. A tank of clean solvent, an arbor press, and equipment for heating bearings and gears, should be available for shrinking these parts on shafts.

Our factory is prepared to repair reducers for customers who do not have proper facilities or who for any reason desire factory service.

The oil seals are of the rubbing type and considerable care should be used during disassembly and reassembly to avoid damage to the surface which the seals rub on.

The keyseat in the input shaft as well as any sharp edges on the output hub should be covered with tape or paper before disassembly or reassembly. Also be careful to remove any burrs or nicks on surfaces of the input shaft or output hub before disassembly or reassembly.

ORDERING PARTS:

When ordering parts for reducer specify reducer size number, reducer serial number, part name, part number and quantity.

It is strongly recommended that when a pinion or gear is replaced, the mating gear or pinion be replaced also.

If the large gear on the output hub must be replaced, it is recommended that an output hub assembly of a gear assembled on a hub be ordered to secure undamaged surfaces on the output hub where the oil seals rub. However, if it is desired to use the old output hub, press the gear and bearing off and examine the rubbing surface under the oil seal carefully for possible scratching or other damage resulting from the pressing operation. To prevent oil leakage at the shaft oil seals the smooth surface of the output hub must not be damaged.

If any parts must be pressed from a shaft or from the output hub, this should be done before ordering parts to make sure that none of the bearings or other parts are damaged in removal. Do not press against outer race of any bearing.

Use old shaft oil seals may be damaged in disassembly it is advisable to order replacements for these parts.

REMOVING REDUCER FROM SHAFT:

CAUTION: Remove all external loads from drive before removing or servicing drive or accessories.

WARNING

To ensure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.

STRAIGHT BORE —

Loosen screws in both output hub collars. Remove the collar next to end of shaft. This exposes three puller holes in output hub to permit use of wheel puller. In removing reducer from shaft be careful not to damage ends of hub.

TAPER BUSHED —

1. Remove bushing screws.

2. Place the screws in the threaded holes provided in the bushing flanges. Tighten the screws alternately and evenly until the bushings are free on the shaft. For ease of tightening screws make sure screw threads and threaded holes in bushing flanges are clean.

3. Remove the outside bushing, the reducer and then the inboard bushing.

DISASSEMBLY:

1. Position reducer on its side and remove all bolts. Gently tap the output hub and input shaft with a soft hammer (rawhide not a lead hammer) to separate the housing halves. Open housing evenly to prevent damage to the parts inside.

2. Lift shaft, gear, and bearing assemblies from housing.

3. Remove seals from housing.

REASSEMBLY:

1. **Output Hub Assembly:** Heat gear to 325°F to 350°F to shrink onto hub. Heat bearings to 270°F to 290°F to shrink onto hub. Any injury to the hub surfaces where the oil seals rub will cause leakage making it necessary to use a new hub.

2. **Countershaft Assembly:** Shaft and pinion are integral. Press gear and bearings on shaft. Press against inner (not outer) race of bearings.

3. **Input Shaft Assembly:** Shaft and pinion are integral. Press bearings on shaft. Press against inner (not outer) race of bearings.

4. Drive the two dowel pins into place in the right-hand housing half. Position right half of housing (as shown in drawing) on blocks to allow clearance for protruding end of output hub.

5. Apply a few drops of oil to all bearings. Mesh output hub assembly, countershaft assembly and input shaft assembly together and place in the housing half. Tap lightly with a soft hammer (nylon or rawhide, not a lead hammer) until bearings are properly seated. Gearing should spin freely if bearings are properly seated.

6. Place input housing half into position and tap with a soft hammer until seated and housing flanges are together. Insert and torque down housing bolts. Spin input shaft to check for any drag or binding, assemblies will turn freely if housing is properly seated. Torque housing bolts per torque values listed below.

Table 3 — Housing Bolt Torque Values

Reducer Size	Recommended Torque
TXT1 & TXT2	360 lbs.-ins.

Extreme care should be used in installing seals on input shaft and output hub to avoid damage to seals due to contact with sharp edges of the keyseat in the input shaft or the retaining ring groove in the output hub. This danger of damage and consequent oil leakage can be decreased by covering the keyseat and groove with tape or paper which can be removed subsequently. Chamfer or burr housing bore if end of bore is sharp or rough. Fill cavity between lips of seal with grease. Seals should be pressed or tapped with a soft hammer evenly into place in the housing, applying force only on outer corner of seals. A slight oil leakage at the seals may be evident during initial running in, but will disappear unless the seals have been damaged.

Table 4 — Manufacturers' Part Numbers for Replacement Output Hub Bearings

TORQUE-ARM Reducer Drive Size	Output Bearing	
	DODGE Part Number	SKF Part Number
TXT109 TXT115 TXT125	424020	6011NR
TXT209 TXT215 TXT225	424022	6013NR

Table 5 — Manufacturers' Part Numbers for Replacement Countershaft Bearings

TORQUE-ARM Reducer Drive Size	Counter Bearing Input Side		Countershaft Bearing Adapter Side	
	DODGE Part Number	SKF Part Number	DODGE Part Number	SKF Part Number
TXT109 TXT115 TXT125	424006	304SG	424006	304SG
TXT209 TXT215 TXT225	424000	305MG*	424000	305MG*

Table 6 — Manufacturers' Part Numbers for Replacement Input Shaft Bearings

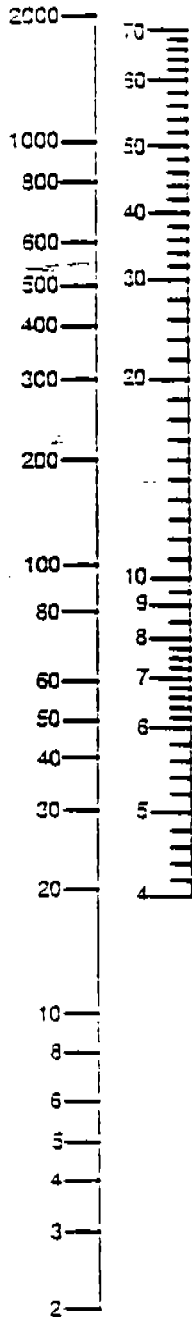
TORQUE-ARM Reducer Drive Size	Input Bearing Input Side		Input Bearing Adapter Side	
	DODGE Part Number	SKF Part Number	DODGE Part Number	SKF Part Number
TXT109 TXT115 TXT125	424112	205SG*	424011	204MG*
TXT209 TXT215 TXT225	424019	206MG*	424090	305SG*

*MRC BRG

VISCOSITY CLASSIFICATION EQUIVALENTS

KINEMATIC VISCOSITIES

cSt/
40°C cSt/
100°C



ISO VG

AGMA GRADES

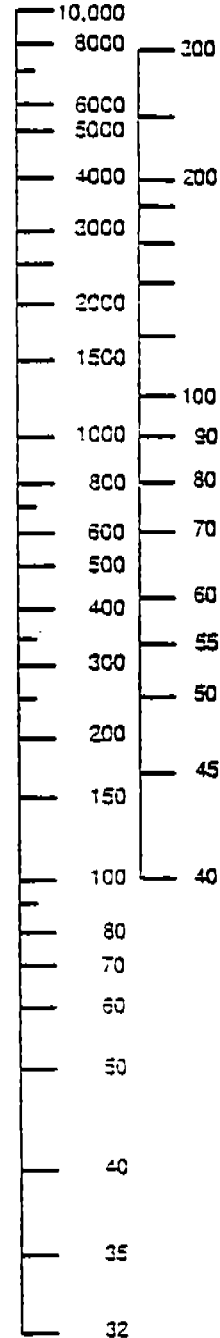
SAE GRADES
GEAR OILS

1500		
1000	8A	250
680	8	
460	7	140
320	6	
220	5	90
150	4	
100	3	85W
68	2	80W
46	1	75W
32		
22		
15		
10		
7		
5		
3		
2		

Viscosities can be re-
lated horizontally only.
Viscosities based on 96
VI single grade oils.
ISO are specified at
40°C.
AGMA are specified at
40°C.
SAE 75W, 80W and 85W
specified at low
temperature. Equivalent
viscosities for 100°F
and 200°F are shown.
SAE 90 to 250 specified
at 100°C.

SAYBOLT VISCOSITIES

SUS/
100°F SUS/
210°F





MOTORTRONICS INC.

HV1 SERIES

1/2 to 20 HP

OPERATION AND SERVICE MANUAL

MOTORTRONICS INC
PO BOX 17159
13214 - 38th STREET NORTH
CLEARWATER FL 34622
TELEPHONE 813-573-1819
FAX 813-573-1803

REV 3

DESCRIPTION

The HV1 series soft start offers low cost control for material handling applications. Typical applications include conveyors, cranes, palletizers and pumps. It is designed to soft start three phase AC induction motors from 1/2 to 15 HP and provides stepless acceleration with adjustable starting torque, adjustable ramp time and adjustable flex time. The flex time adjustment takes up slack in a conveyor system and can also extend the starting time on lightly loaded motors. The system will operate in one of the three following modes:

Acceleration features three adjustments that tailor motor performance to optimize the starting characteristics of the motor to the drive system. Starting torque level adjustment sets the initial torque level where the flex time starts. The starting torque level adjustment span is 0-100% of line voltage. Flex Time control adjusts the amount of time the initial torque is held constant to take-up slack in the mechanical system. The range on this adjustment is 0 to 6 seconds. The Starting Ramp Time adjustment range is 0 to 30 seconds. A jogging operation can be performed during the acceleration mode.

Running mode refers to the period of time that follows the acceleration mode. During this period, the motor will run at full speed (torque) until a stopping signal is initiated.

Stopping mode is an instantaneous power off. The stopping time will depend on the load. A free wheeling load will coast to a stop and a medium to high load will stop instantaneously. Deceleration mode is available as an option mode. (See Option D manual)

The HV1 solid state control is designed for 500% starting current and is available in open panel version or standard NEMA enclosures.

INSTALLATION / UNPACKING

UNPACKING Carefully unpack the unit from the shipping carton and inspect it for shipping damages. Immediately report any damages to the carrier.

MOUNTING Select mounting location and make sure ambient temperature does not exceed operating range limits given in specifications. Mount units vertically so that heatsink fins are parallel to vertical mounting surface. Make sure that clearance on top and bottom of unit is at least six (6) inches.

WIRING Connection diagrams illustrate typical wiring connections. Note: All wiring must comply with local codes, regulations and ordinances.

WARNING

DO NOT SERVICE EQUIPMENT WITH VOLTAGE APPLIED. UNIT CAN BE THE SOURCE OF FATAL ELECTRICAL SHOCKS.

TYPE of LOAD Three phase induction motor

AC SUPPLY VOLTAGE 208, 240, 360, 415, 480
or 575 Vac $\pm 10\%$ to -10% , 50/60 Hz line voltages

HP RATINGS 1/2 to 15

POWER CIRCUIT 3 SCR's, 3 diodes

SCR Peak Inverse Voltage
(PIV Rating) Line Voltage

1200	208 to 480
1400	575

AMBIENT TEMPERATURE Operating range 0 to 50 degrees C (32 degrees F to 122 degrees F)

ADJUSTMENTS (Standard)

FLEX TIME	0 to 6 Seconds
STARTING TORQUE	0 to 100%
STARTING RAMP TIME	0 to 30 Seconds

AUXILIARY CONTACTS

Standard unit	One N.O.
Deceleration unit	Two Form C

OVERLOAD CAPACITY

CONTINUOUS	115%
30 SECONDS	500%

PHASE INSENSITIVITY Unit operates with any phase sequence

COOLING Convection cooling

CONNECTIONS



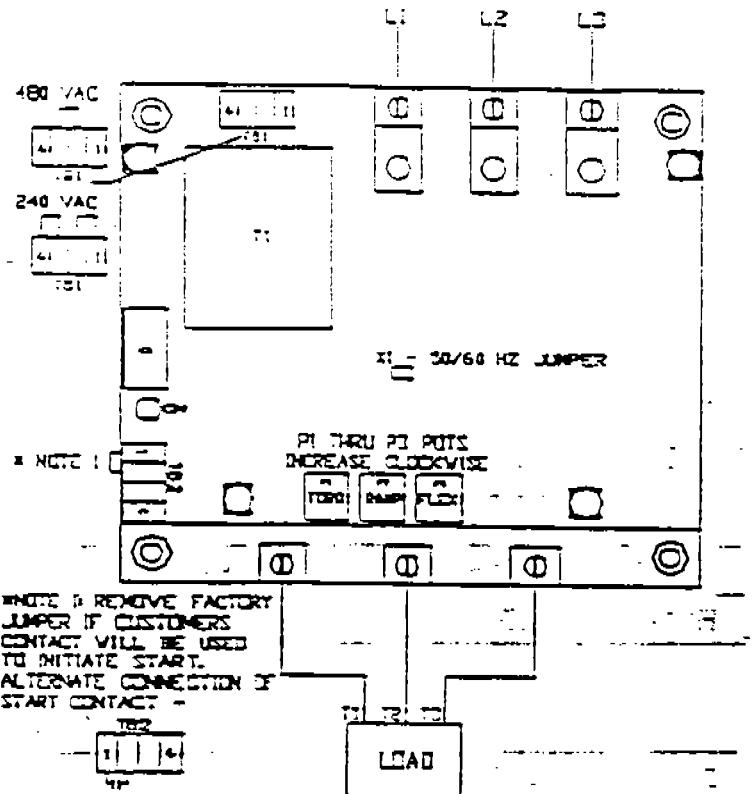
1. Connect power lines L1, L2, and L3 to the line power lugs located on the PC board.
2. Connect load wires T1, T2 and T3 to the load lugs located on the heatsink.
3. The connection of the 6 power wires (3 in and 3 out) permits the motor to automatically start when power is applied. An alternate connection for T32 is shown (see note 1) to add a dry contact closure to start the motor.
4. Verify all connections for tightness!
5. Check the unit for proper line to line voltage connections. Reference TB1 connections shown in connection diagram. (Strapping information is shown on the connection diagram). In order to meet electrical codes, Motortronics recommends the use of some kind of air gap or isolation contactor to provide electrical isolation of the controller and motor circuit when the motor is shut down.

START UP PROCEDURE

1. Verify that the wiring instructions have been completed.
2. Verify that the horsepower and current ratings of the HV1 match or exceed the ratings of the motor.
3. Set the adjustment potentiometers as follows:

Torque pot fully counter clockwise (minimum)
 Ramp pot fully clockwise (maximum time)
 Flex pot fully clockwise (maximum time)

4. If unit is to be operated at 50 Hz remove the plug jumper marked X-1 located on the PC board.
5. **TORQUE ADJUSTMENT:** The torque setpoint is adjustable from 0 to 100%. The level is increased by turning the pot clockwise. Apply power to the unit. Increase the torque level until the motor just starts to roll. In six seconds the board will begin to ramp after the flex period. Remove power and let the motor come to a complete stop. Repeat the process until the torque is set properly for the application.
6. **FLEX ADJUSTMENT:** The flex time is adjustable from 0 to 6 seconds. During this time period the unit will remain at the initial torque level. This time is decreased by turning the pot counter clockwise. Remove power and let the motor come to a complete stop. Reapply power and observe the load. Decrease the flex time to the minimum time necessary to for the application. The flex time will allow the system to take up slack at a low torque level to eliminate mechanical shock. The flex time can also help extend the start time on lightly loaded motors.
7. **RAMP ADJUSTMENT:** The ramp adjustment changes the amount of time for the control to reach full torque. The time is adjustable from 1 to 30 seconds. The interaction of all three adjustments will determine actual time it will take for the motor to attain full speed. The ramp was set for 30 seconds during the preparation for start up. If this time is too long, adjust the ramp pot in the counter clockwise direction. Remove power and let the motor come to a complete stop. Reapply power and observe the load. Further adjustment of all three pots may be necessary for the ideal start for each application.



DIMENSIONS

MODEL #	PANEL			NEMA 1			NEMA 12		
	H	W	D	H	W	D	H	W	D
HV1-1									
HV1-2	5.2	6.0	4.3	11	7	7	12.5	10	5.3
HV1-3									
HV1-4	9.0	9.0	5.3	15	10	8.0	12.5	11.4	7.2

DIMENSIONS ARE IN INCHES - H=HEIGHT
W=WIDTH - D=DEPTH

REPLACEMENT PARTS

SCRS

MODEL #	120 THRU 480 VOLT	575 VOLT
HV1-1	SCR-H-1-480	SCR-H-1-575
HV1-2	SCR-H-2-480	SCR-H-2-575
HV1-3	SCR-H-3-480	SCR-H-3-575
HV1-4	SCR-H-4-480	SCR-H-4-575

DIODES

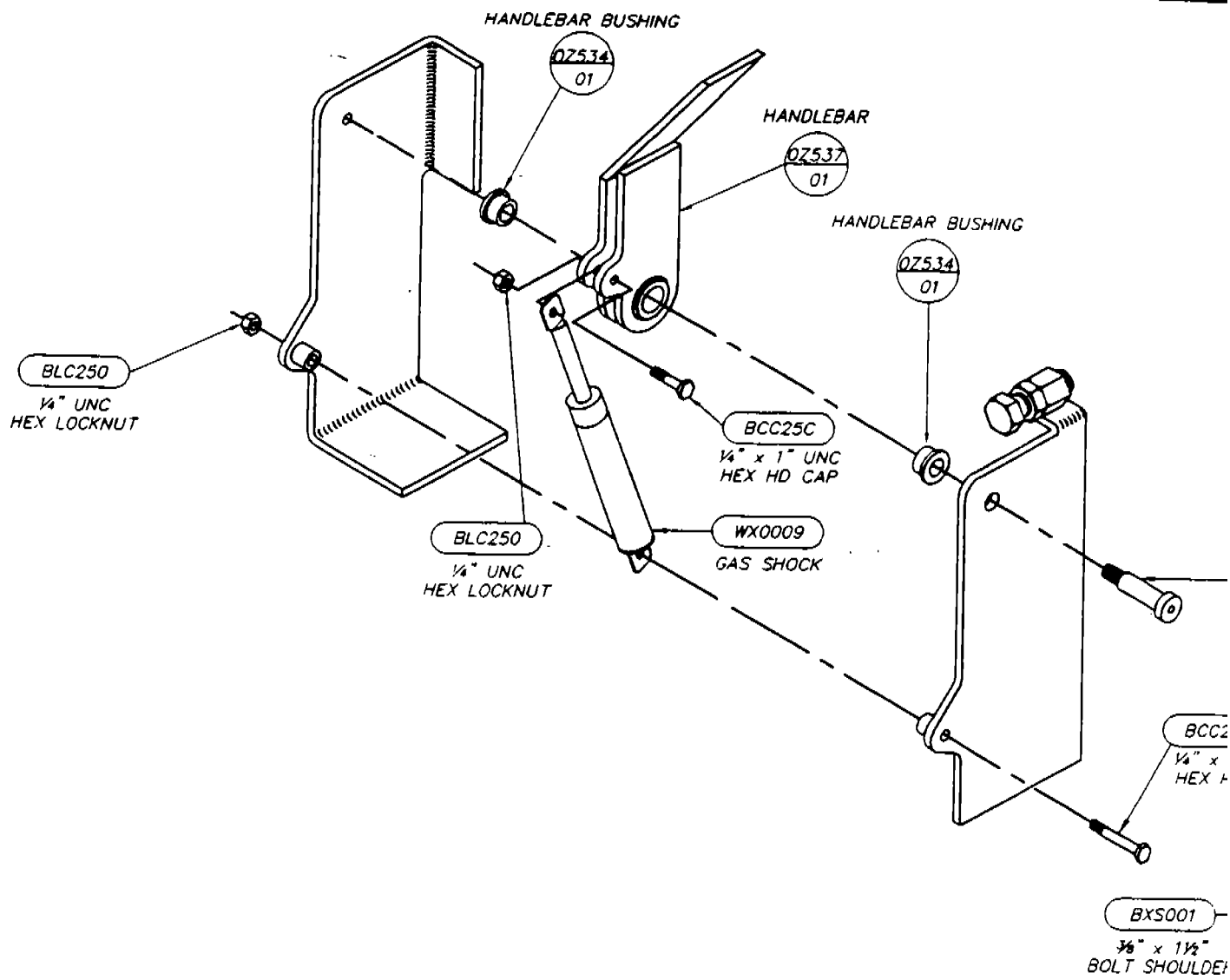
MODEL #	120 THRU 480 VOLT	575 VOLT
HV1-1	DIODE-H-1-480	DIODE-H-1-575
HV1-2	DIODE-H-2-480	DIODE-H-2-575
HV1-3	DIODE-H-3-480	DIODE-H-3-575
HV1-4	DIODE-H-4-480	DIODE-H-4-575

CONTROL BOARDS

208 & 240 VOLT	380 VOLT	415 VOLT	480 VOLT	575 VOLT
HCL1000-240	HCL1000-380	HCL1000-415	HCL1000-480	HCL1000-575

IMPORTANT INFORMATION

Mctortronics Inc. warrants its products against defects in material and workmanship for one (1) year from the date of installation and up to a maximum of (18) months from date of manufacture. Service is available at our factory and through our distributors and sales representatives. Solid state controls have different operating characteristics from those of electro-mechanical equipment. Because of these differences and the wide variety of applications for solid state controls, each application designer must satisfy himself that the solid state equipment is acceptable for his application. In no event will Mctortronics Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment. The diagrams and illustrations in this document are included solely for illustrative purposes. Because of the number of different applications, Mctortronics can not be responsible or liable for actual use based on the examples or diagrams.



BL
1/4"
HEX L

