

**Instructions for Operation**

X  
MFG: HUSS-HEINER, WILHIEM, &  
CO.  
NAME: SWING AROUND

**of**  
**SWING AROUND Amusement Ride**

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Drawings No. A1-16910  
No. 1-19427

Maintenance Instructions for the Compressor

## 1. ERECTION

### Centre Piece

1. Position the centre piece true to dimensions and horizontally on the foundation constructed in accordance with Fig. 1-19427. Particular care must be taken that the height from the lower edge of the centre plate to the upper edge of the flooring, is 440 mm or  $17\frac{21}{64}$  '' .

If necessary, spacer plates with a 27  $\phi$  hole for the anchor bolts should be inserted as shims at the four corner points.

2. Cast in M 24 anchor bolts at the four corner points and tighten with 200 Nm after the concrete has set.
3. Fix the two stabilizers onto the centre plate and secure accordingly in the foundation area.

### Extension Bracket

4. In a horizontal position, bolt the boom arm 17 No. 1, with suspended gondola arm 18 to the No. 1 fishplate brackets on the rotating frame 2 .
5. Place the drawbars 19 No. 1 and 19a No. 1a in the correct position on the boom arm 17 and bolt into position at the head of the boom, 20 and 20a .
6. Raise the crane to a height that enables the drawbars No. 1 and 1a to be bolted to the upper eyes No. 1 and 1a on the rotating frame.
7. Attach the boom arm and gondola arm No. 2 as described under items 4 - 6.
8. Loosely bolt together boom arm No. 1 and boom arm No. 2 .
9. Follow the same sequence up to boom arm No. 13.
10. Connect forcing lever 21 to boom arms Nos. 1 and 13 and adjust accordingly. Subsequently attach No. 14 as described under items 4 - 6.
11. After the boom arms have been mounted, tighten all M 24 connecting bolts, material 8.8, tighten with 580 Nm and secure with split pins.
12. Connect the pneumatic hoses after carefully cleaning the connecting parts and connect up the electric cables.

13. Suspend the gondolas 29 from the gondola arms in the order marked 1-14. Tighten the M 24 bolts with 200 Nm and then lock.
14. Attach the limiting fender rods 30 on the gondola arm, connect up the electric wiring.

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## II. STARTING AND SHUTDOWN

The daily starting procedure is as follows:

1. Close all open drainage valves in the pneumatic system.
2. Switch on the electric master switch.
3. Check the swing limit stop as follows:  
Move one gondola arm at a time approx.  $15^{\circ}$  outwards - the corresponding control lamp on the rotating frame must light up after 1.5 s - now slowly release the gondola arm; the control lamp should go out when the gondola arm is at an angle of approx.  $10^{\circ}$ . Any defects must be remedied immediately.
4. Switch on the two compressors.
5. After a thorough trial run with the gondolas empty and testing all possible operating programmes including the flashing lights programme, the carrousel can start operating.

When shutting down the carrousel, the compressors may only be switched off after the carrousel has come to a standstill. All drainage valves should be opened under pressure shortly before the compressors are switched off. After this, switch off the electric master switch.

### ATTENTION!

Should the swing limit stop not function properly (noticeable in that the gondola swings out too far) the cause must be found and remedied immediately.

### III. MAINTENANCE AND GREASING (for operation in summer)

#### A) Carrousel Drive Motor

##### 1. Drive Motor 31

3-phase current motor with full thermic protection. In dusty conditions, the motor should be blown through with dry air at regular intervals in order to remove deposits inside and at the ventilation apertures.

##### 2. V-belts 32

The four V-belts, Type SPB, clear width = 3150 mm, in accordance with DIN 7753 Page 1, should be protected against heavy dirt. The tension of the V-belts is regulated by two tensioning bolts on the drive motor. For this purpose, the four bolts on the motor skid base must be slightly loosened. After every season, the V-belts should be checked and replaced if necessary.

##### 3. Coupling 33

The hydrodynamic start and safety coupling is filled with Automatic Transmission Fluid ATF and must always be operated with a constant oil level. The 8.25 litres of oil should be renewed after 4000 hours of operation. There are appropriate filler nozzles and drain sleeves for this purpose.

##### 4. Gearing 34

The gearing is filled with 4 litres of SAE 90 gear lubricant oil. The oil should first be changed after 30 hours of operation, and subsequently after every 2000 hours of operation. There are appropriate filler nozzles and drain sleeves for this purpose.

##### 5. Drive pinion

The pinion is mounted on a shear pin clutch. On overloading, four 12  $\phi$  m 6 x 87 long pins of ST 52-3 steel shear off. These pins should be replaced by pins of the same dimensions and of the same material.

##### 6. Toothed Turning Ring 36

The tothing of the turning ring should be greased with MOLYKOTE 165 BR or ESSO-SURETT 30 toothed-gear grease approx. every day or as soon as bare patches can be observed on the tooth profiles.

The ball-bearing track of the turning ring should be greased with ESSO-BEACON 2 roller bearing grease every day, or at least after every 30 hours of operation. For this purpose, there are four grease nipples marked yellow: Turn the bearing when greasing.

At regular intervals, check that the securing bolts of the turning ring are firmly seated and tight. For this, use the M 20 torque key with 330 Nm supplied with the carrousel.

B) Carrousel Brake

1. Brake Cylinder 37

It is advisable to remove and dismantle the brake cylinder in order to clean it thoroughly after each season. Check the condition of the packings and exchange if necessary. All parts should be lightly greased before reassembly.

2. Bearings

All bearings should be lightly greased during the annual maintenance work.

3. Brake blocks 45

The two brake blocks have a riveted brake lining, 140 x 10 x 630 long, which should be renewed at regular intervals. Recommended makes:

BREMSIT WS 5021 or TOPCO-ASBEST Type 22 or JURID 440 or JURID 854.

Necessary rivets: 34 rivets, B 6 x 18, DIN 7338 - Cu.

C) Pneumatic System

1. 2 Hydrovane compressors, type 120 PU A are incorporated in the carrousel, see the enclosed special instructions for service and maintenance.

2. Oil and Water Separators 38

After several hours' operation open the drainage valves of the separators under pressure to release the resulting oil and condensate.

At regular intervals dismantle and clean the separators.

3. Condensate section 39

The condensate from the pneumatic system should be drained off after several hours' operation by opening the drainage valve.

4. Pneumatic rotating connection 40

The pneumatic rotating connection is located at the base of the axle of the rotating body axle and has maintenance - free bearings of artificial carbon. The bearings should be renewed when they are no longer tight.

5. Pneumatic cylinders 41

The fourteen pneumatic cylinders with magnetic control valves are made entirely of non-rusting material and designed for operation without oil. After each season, i. e. after approx. 1000 hours of operation, we recommend that the insides of the cylinders be thoroughly cleaned. At the same time, check the piston collars and sealing rings and exchange if necessary. All parts should be lightly greased before reassembly.

D) Gondola Arm Bearing and Switch Element

1. Gondola arm bearing

The gondola arms 18 are suspended in the heads of the booms 20 and 20a by means of two flange bearings each. Each flange bearing incorporates one self-aligning bearing with roller bearing lubricant, sealed with a collar. Subsequent greasing is possible. The flange bearings should be dismantled after approx. 6000 hours of operation in order to clean the bearings and to refill with ESSO-BEACON 2 roller bearing lubricant.

2. Switch element to control the pneumatic impulses

The switch element on the gondola arm crosshead 42 is situated in the head of the boom arm. Its function is to activate a terminal switch when the swing reaches its turning points. For this purpose, the switch element has two two-piece friction discs, which enable the indexing disk to be carried to its end position. No lubricants may be used in this area as they would alter the friction values. The thickness of the friction disks is to be checked at regular intervals. When the thickness is 4 - 5 mm, (the disks must be replaced by) new 8 mm-thick friction disks of asbestos, type 22 with brass wire inlay. To do this, it is only necessary to press back the pressure disk.

**ATTENTION!**

Check that the tensioning rods, items 19 und 19a are firmly in position and tight at regular intervals, at least every 2 weeks. If necessary, re-tighten to 150 Nm. To do this, loosen the counter-nuts and make sure that the tensioning rods cannot be twisted.

Wiring diagram and description  
for carousel SWING AROUND

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4: control

5: control

6: control

} distribution box 1

7+8: distributions box 3-control

9+10: distributions box 4-control

11: distributions box 2-light

12: distributions box 5-light

Power supply SWING AROUND serial number 33868

Motors: compressor 1 19kW

compressor 2 19kW

driving motor 37kW

supply 75kW

125 A

3 phase 460V

60 CY

Light: 22kW

70A 3phase

200A 1phase

110/115 V

60 CY

lamps max. 15 W

lamps for cars 24V max.18W

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CARROUSEL SWING AROUND

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### Driving Motor

The driving motor cannot be started when the switch "brakes" has been actuated, and the driving motor is stopped when the switch "brakes" is actuated.

When the driving motor is running and the oscillation is on the motor cannot be stopped directly with the switches "driving motor off" and "brakes". At first the oscillation impulses are now turned off and the oscillation brakes are turned on for approx. 5 sec. Only after that the driving motor is stopped automatically and the braking operation will start.

### Brakes

The automatic braking operation is blocked in case a limit switch has been actuated or has become defective, down to a speed of 5 R.P.M. after the turning off of the driving motor. This blocking action will only be neutralized during the next drive.

### Oscillation

The oscillation impulses can only be turned on when the driving motor is fully started and when both speed indicators have been switched. The speed indicator 2647 will switch at approx. 10 R.P.M.

The clock impulses will be given by a limit switch at arm 0 and will be limited to approx. 0.7 sec. In distribution box 3. These impulses are distributed to the 14 control groups in the distribution boxes 3 + 4 - and thus to the respective solenoid valves - with the aid of the compressed air cylinder.

The oscillation width of the cars is limited by a limit switch for each car. When the upper or lower limit is reached, a delay timing relay will be switched off for approx. 1,5 sec. so that the following air impulse will be blocked.

In case a safety limit switch is used, the driving motor cannot be started or will be stopped immediately. The automatic brakes will be released and will remain blocked.

### Oscillation brakes

The oscillation brakes cannot be switched on or off manually. The oscillation brakes will be switched on automatically when the driving motor is stopped. The oscillation brakes will only be operated if an oscillating movement has taken place beforehand. The turning off of the oscillation brakes will be carried through with the aid of a timing relay after a period of approx. 5 sec. The oscillation brakes work directly onto the respective solenoid valve with the aid of 14 limit switches. The limit switches are wired in such a manner that the valves are always opened against the direction of oscillation of the cars.

### Automatic

With the aid of the switch "automatic", the automatic control can be turned on or off. When the automatic is turned on, the running time relay will start after the turning on of the driving motor, and it will stop the driving motor when the set time is over.

The oscillation impulses will be turned on at approx. 10 R.P.M., and they will be changed automatically to oscillation brakes.

The driving brakes will be switched on automatically and they will remain fixed until they are switched on again.

This automatic braking operation can be neutralized by slightly pressing the braking switch.

### Control operation during an automatic drive

The automatic drive is turned on, the compressors are operating and they have reached the operating pressure.

The switch 4b3 "turn on" is pressed, the relays 4d5 / 4d51 operate and catch, 4d5 operates, and with the aid of 4d6/25 the automatic star-delta-switch is turned on, the driving motor starts and the carousel starts turning.

In current flow 24 voltage is coming over the contacts 3a1 / 3a5 / 4d6 / 4d20 / 4d10 to relay 4d13, 4d13 operates, and also 4d14/26, "oscillation on" is switched on.

Over slipping 19 the control command arrives at the clamp 219 in distribution box 3. Over 5d1 and 5d2 voltage comes to 5d6 and same starts operating. Over clamp 15 voltage comes to the solenoid valve, the oscillation starts.

At the same time 5d1 receives voltage via 5d2 and switches after approx. 0,7 sec., the solenoid valve closes again.

This operation is repeated at 5d3, the cars perform an oscillation movement.

In case the oscillation increases, a limit switch is opened and the timing relay 5d5 is released and blocks the air supply for a period of approx. 1,5 sec.

In case the oscillation increases too much, the safety limit switch is operated, and in distribution box 1 the timing relay 4d19 releases and stops the driving motor immediately and thus prevents the switching on of the driving brakes.

After the run-off the running time relay 4d4, 4d4/19 operate, 4d5/19 + 4d51/20 release, 4d14 releases, 4d15 operates and over slipping 20 the control command "oscillation brakes" arrives at clamp 220. 5d5 starts operating, and over clamp 16 the voltage comes to the control switch brake and also to the solenoid valve, the braking of the oscillation starts.

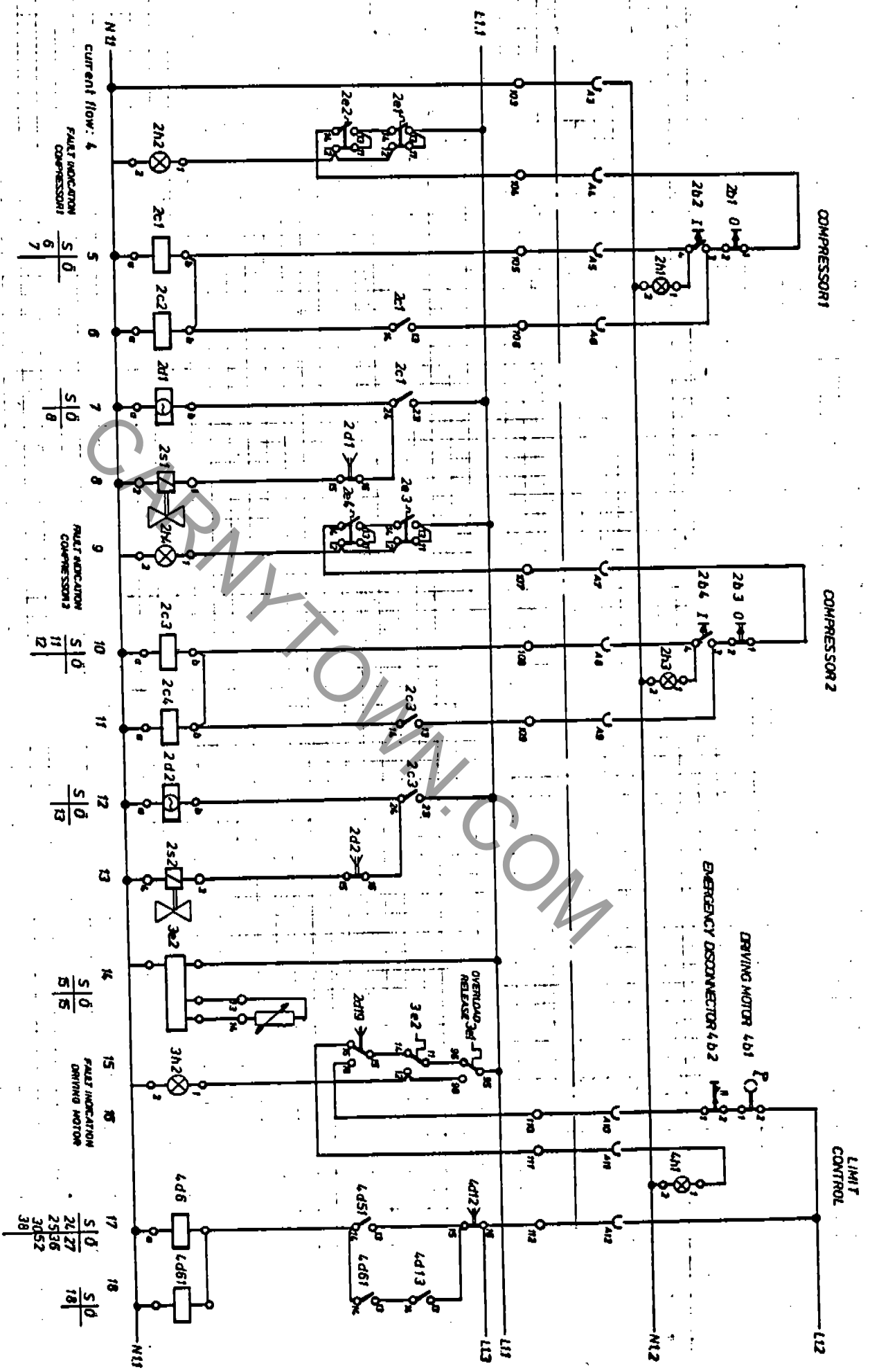
With the release of 4d5 the timing relays 4d11 and 4d12 have been provided with electrical power. After 5 sec. 4d11 opens, 4d15 releases, the oscillation brakes are switched off.

After a further period of 5 sec. the timing relay 4d12 opens, 4d5 releases, the solenoid valve for driving brakes is opened, the speed of the carousel is reduced by braking.

If during the braking operation a safety limit switch is actuated, 4d9 operates and releases the driving brakes.

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Zeichnung Nr.: 040.177-2	Blatt: 2
<b>SHORT DESCRIPTION AND SWITCHING FUNKTION FOR CARROUSEL SWING AROUND</b>	
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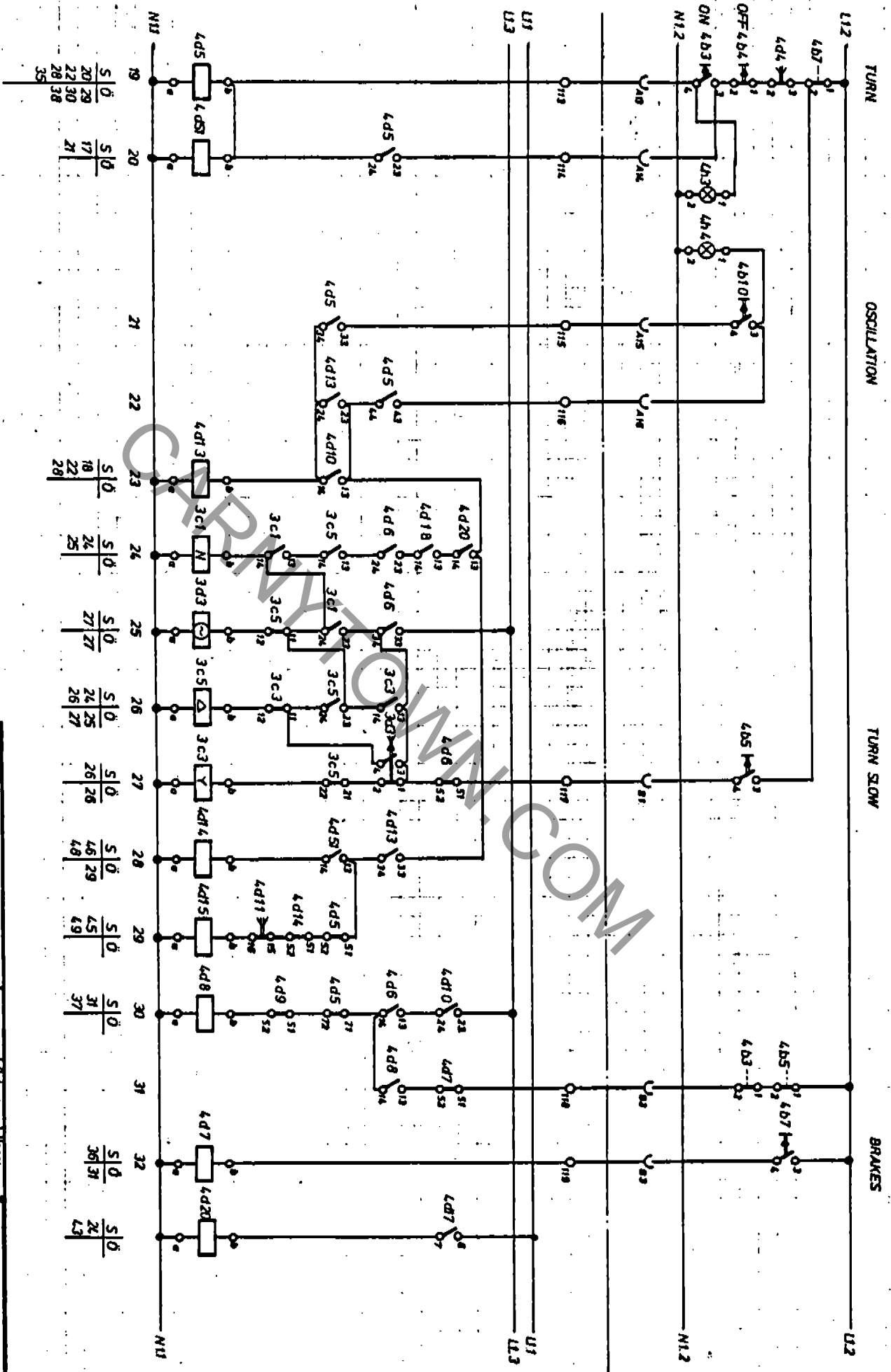




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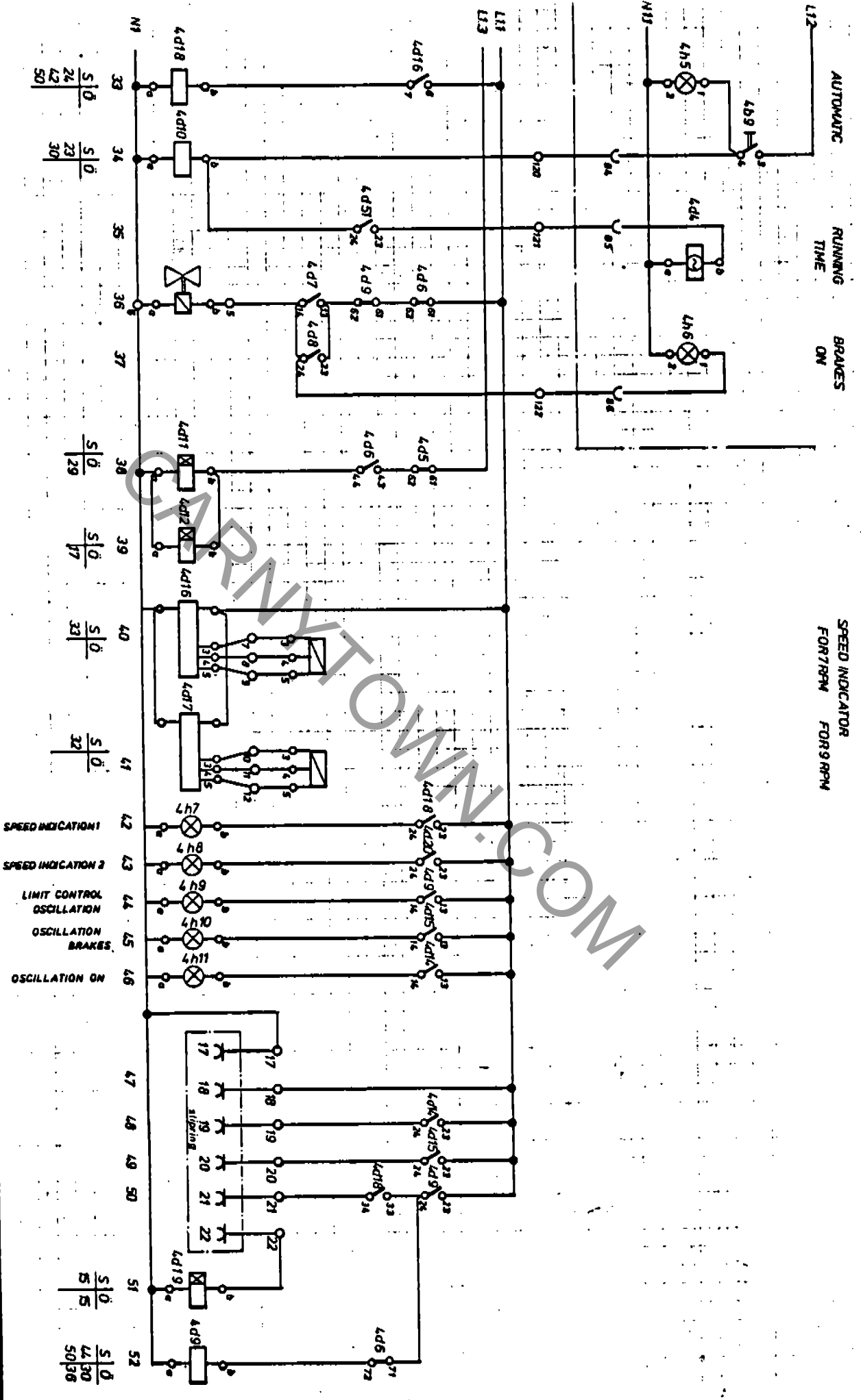
**DISTRIBUTIONS BOX 1 (CONTROL)**  
**CARROUSEL SWING AROUND**



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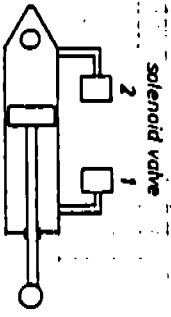
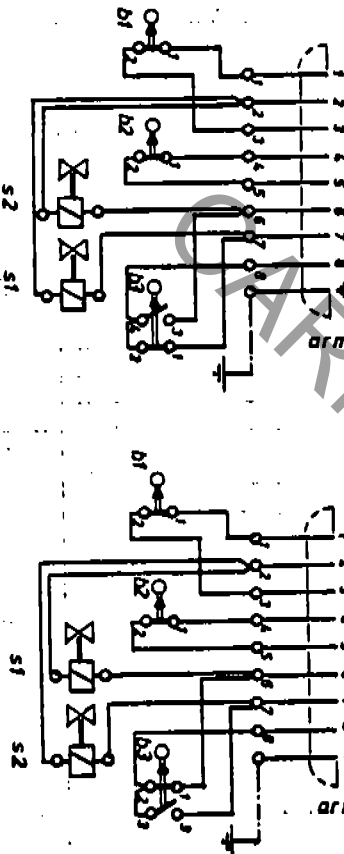
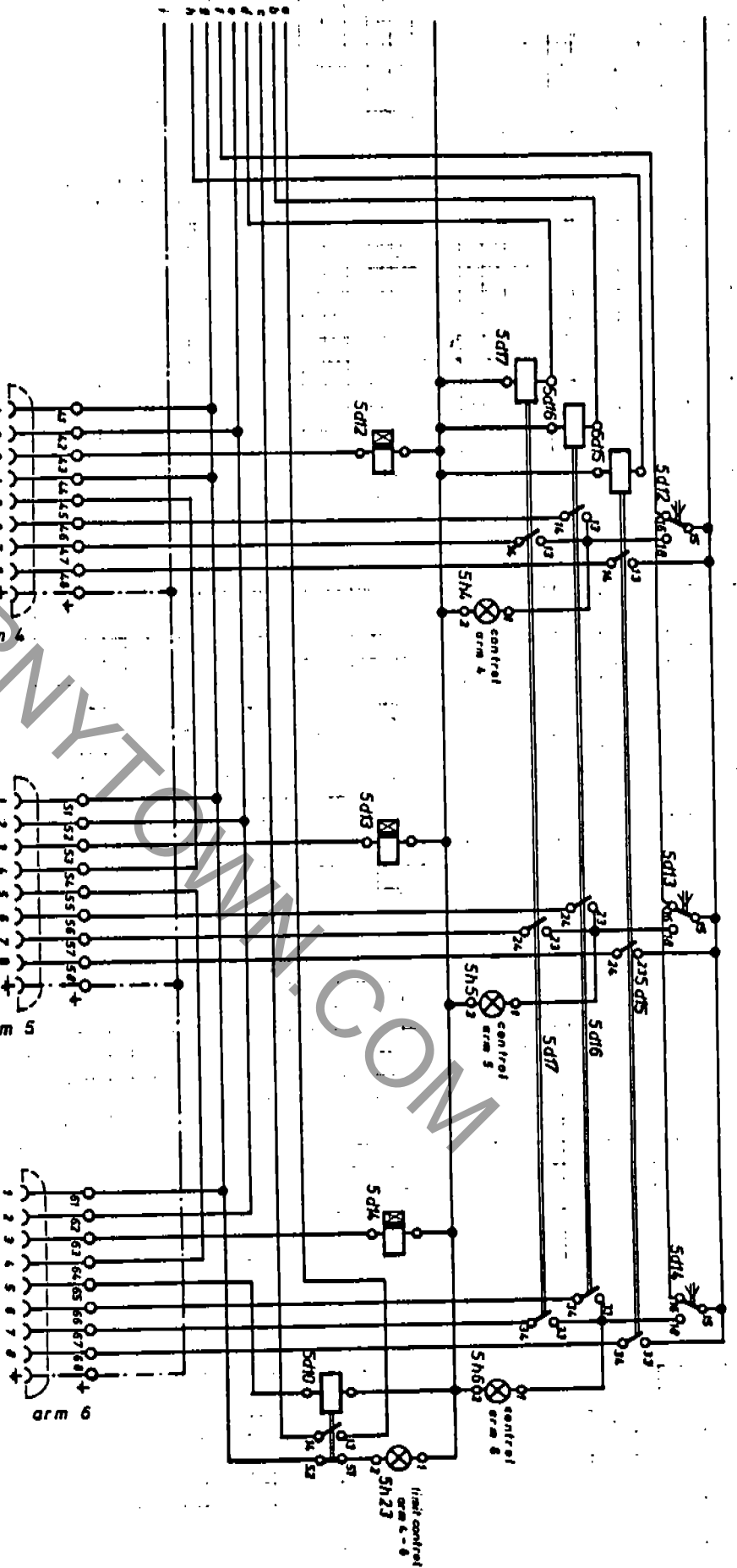


SPEED INDICATOR  
FOR 7 RPM FOR 9 RPM

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CARROUSEL „SWING-ARCADE“



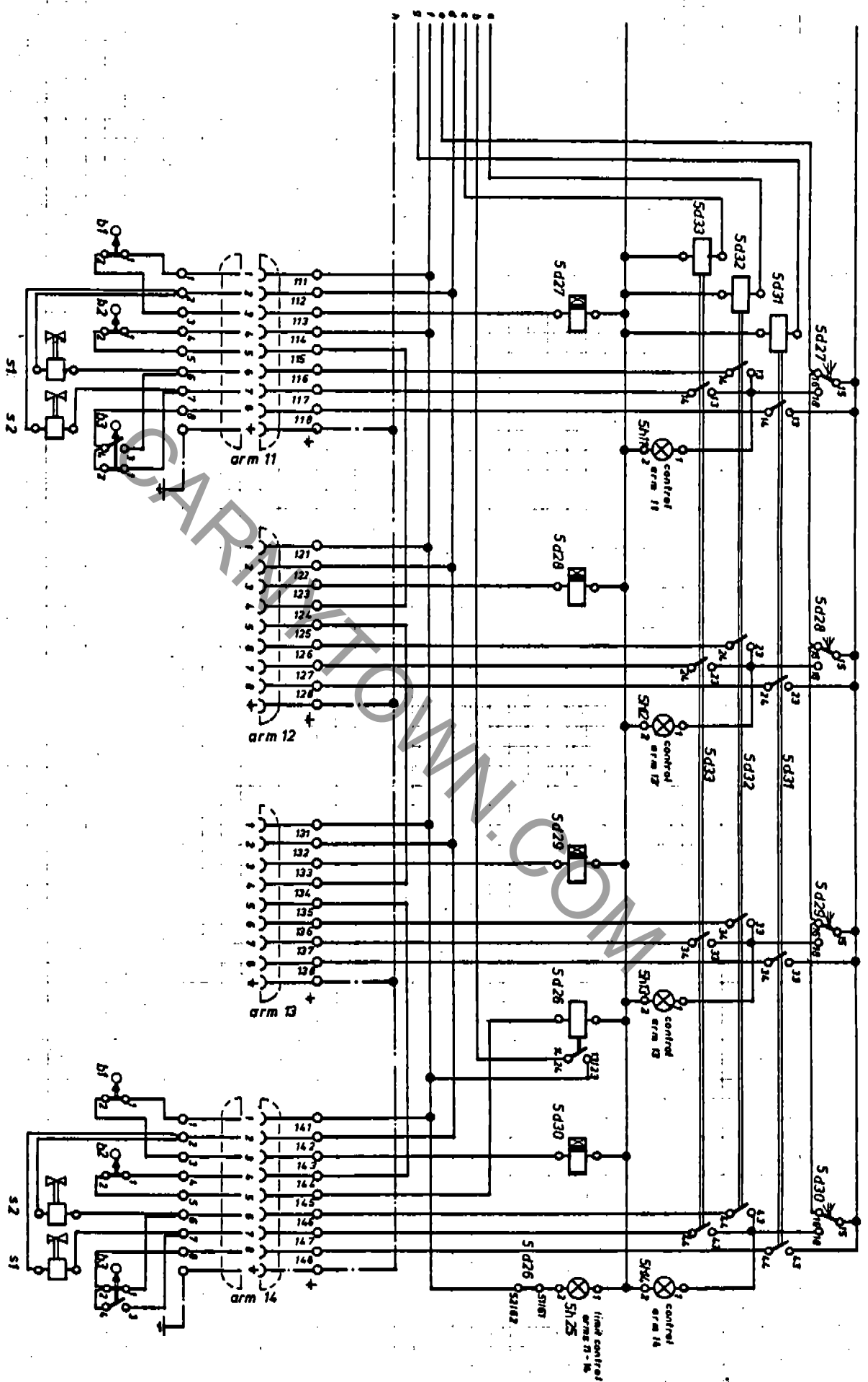
solenoid valve

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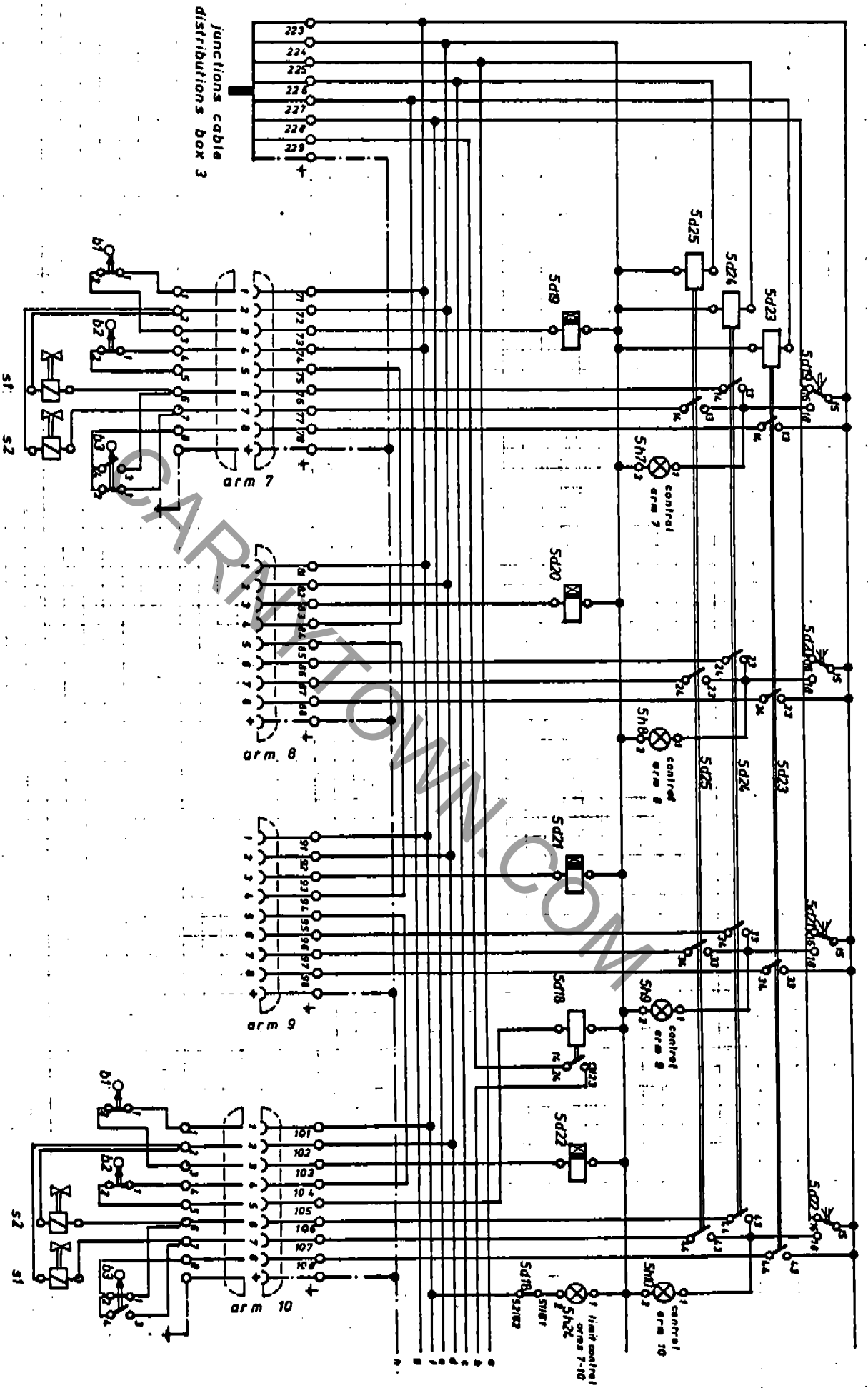




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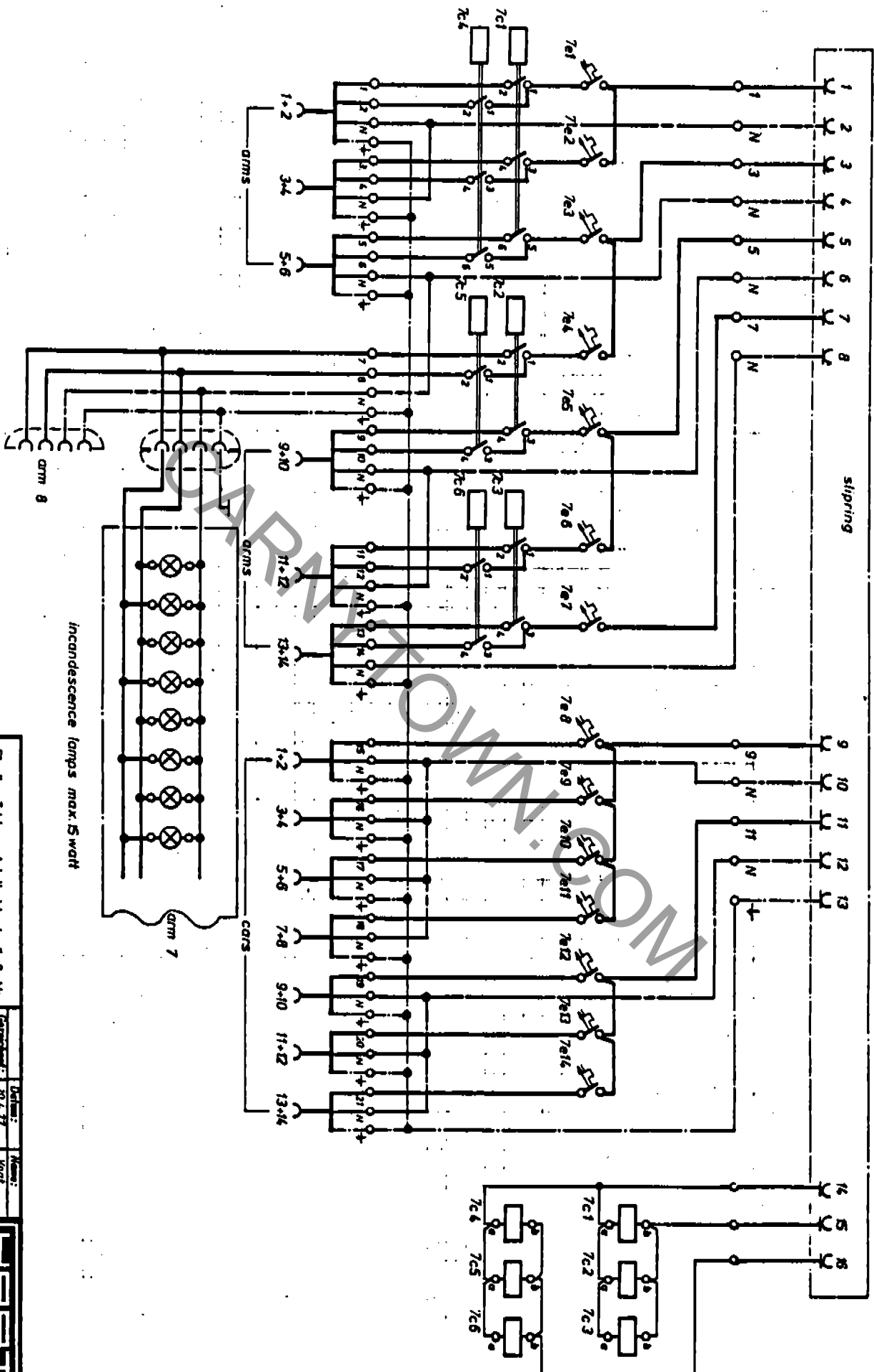


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**CAROUSEL SWING-GROUND**



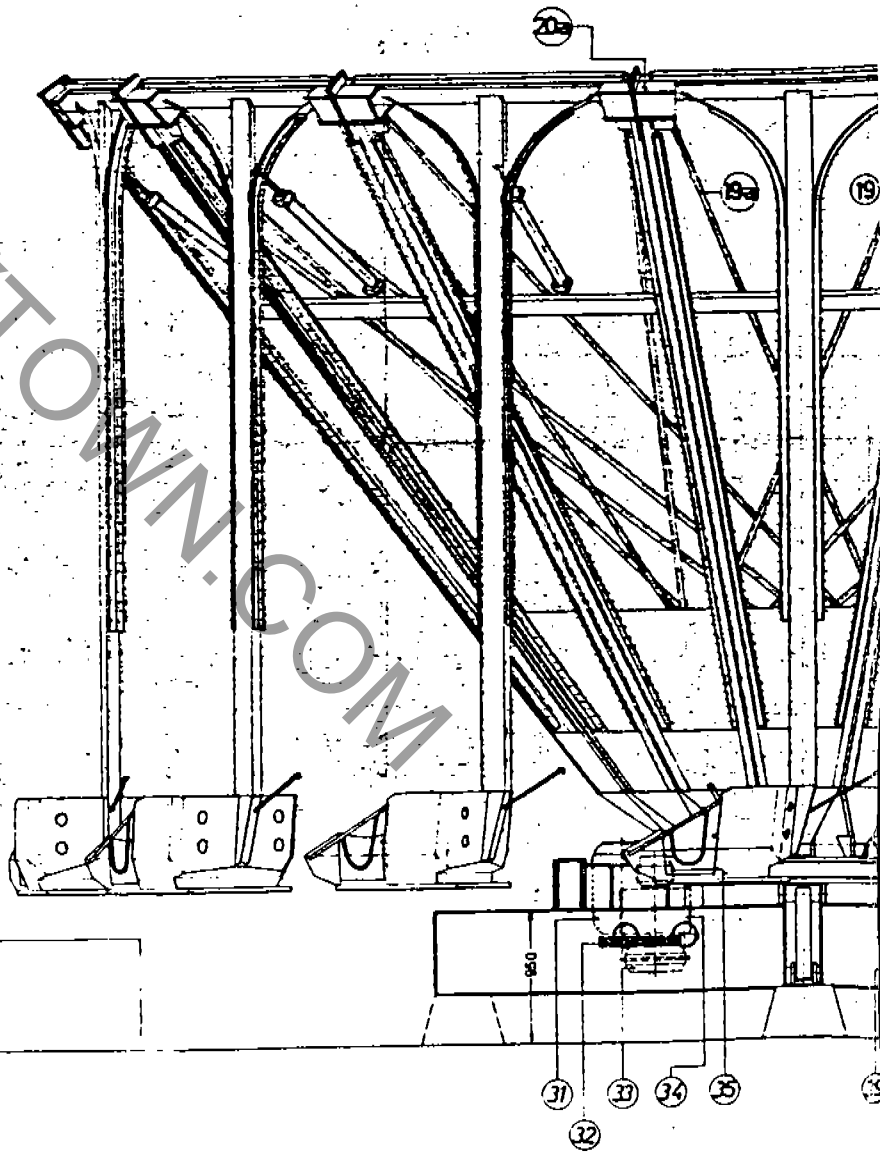
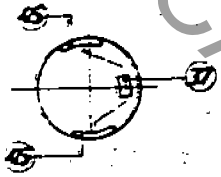


Incandescence lamps max. 15 watt

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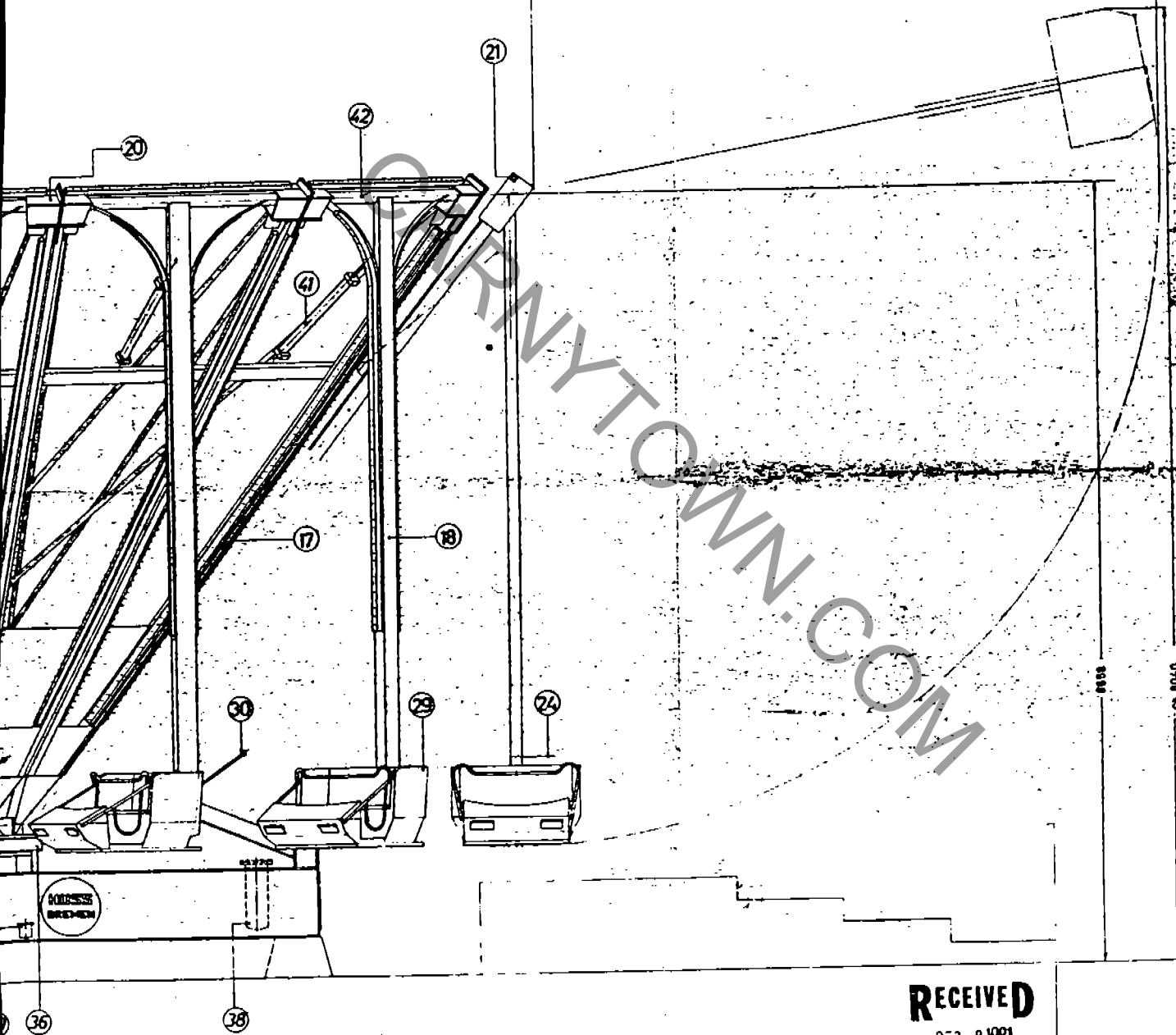
Bestandteil:	20 x 77	Modell:	Vogel
Gezeichnet:			
Zeichnung Nr.: 04.0.177-12			
Name: Messr. 28 Bremen, Henschelweg 10 a Telefon (0401) 9 25 75			

DISTRIBUTIONS BOX 5 (LIGHT)  
 CARROUSEL „SWING-AR“  
 12



max. 21500"

10650"



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Stück	Bezeichnung		Teil	DM	Werkstoff	Bezeichnung
	Ordnung	Name	Werkstoff	Platz-Nr.	Typ	
Ermaschine	16.2.79	23				Heinr. Wlth. Huss u. Co. Maschinen- und Apparatebau Bremen Zentrum 10
Gezeichnet						
Platz-Nr.	Rundfahrtgeschäft Typ: SWING-AROUND					A1-16910
Zusammenbau-Antrag für Betriebsanfertigung						Erstellt am: Freigegeben

CARNYTOWN.COM



MASCHINENFABRIK

OPERATING INSTRUCTIONS

for

AMUSEMENT RIDE "SWING-AROUND", Order No.

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ÜBERNAHMEPROTOKOLL  
ACCEPTANCE CERTIFICATE

für  
for

Rundfahrgeschäft .....

Amusement Ride .....

Auftrag-Nr.: .....

Order No.: .....

Die ordnungsgemäße, vollständige Aufstellung, Übergabe und Einweisung ist gemäß Kaufvertrag vom ..... an den Käufer/ oder dessen Stellvertreter, Fa. .... erfolgt am .....

The proper, complete erection, handing-over and introduction of the buyer/ or his representative ..... to the operation of the ride in accordance with the sales contract of ..... has taken place on .....

Die Betriebs- und Wartungsanleitung sowie die gesonderten Hinweistafeln wurde übergeben/zugesandt und erklärt. Jeder Besitzer dieses Fahrgeschäftes ist verpflichtet, sich beim Herstellerwerk einweisen zu lassen und sich die neueste Fassung der Betriebs- und Wartungsanleitung aushändigen zu lassen.

The Operating and Maintenance Instructions as well as the separately given informative signs have been handed over/sent and explained. Every owner of this ride is obliged to obtain introduction to the operation from the manufacturer and to have the Operating and Maintenance Instructions - latest edition - handed over to him.

Bremen, .....

Hersteller  
Manufacturer

Käufer  
Buyer



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RESPONSIBILITY OF MANAGERS AND OPERATORS

The following remarks are a compulsory condition for the safe operation of the ride:

1. In all cases the manager is ultimately responsible for the safety of passengers during operation of the ride.
2. Selection of operators must correspond to the demands made on them regarding operation of the ride.
3. The operator must devote his undivided attention to the operation of the ride.
4. He must be acquainted with the functioning of the ride, its safety devices, emergency devices, operating instructions and regulations, and ensure the safety of passengers and safe running of the ride.
5. He must have complete and safe control over the unloaded ride before he operates it with passengers.
6. If a malfunctioning occurs operation must cease immediately.
7. Malfunctioning may often be detected by a change in noise during operation. If this occurs, one should look for the cause and, if necessary, get in touch with experts to find the reason for any malfunctioning.
8. The operator must insist on maintenance work being carried out as it is described in detail in the operating instructions. If he does not, he is obliged to cease operation.
9. Before initiation the operator has to check the ride on its perfect working condition by performing the ordered controls and the trial runs.
10. The carrying parts as well as the motor driven parts are to be checked on perfect working condition before each initiation. Damaged parts are to be substituted by perfect ones. Furthermore it has to be observed that the ride is in safe upright position during erection and dismantling. After erection all parts have to be orderly connected and all connecting parts and necessary anchorages have to be mounted in a safe way.
11. The complete operating instructions provided by the manufacturer have to be kept at hand in the operator's stand so that the operator can have a look at them at any time. Upon loss, the manufacturer has to be immediately requested to provide a new copy of the complete operating instructions.
12. During repair and maintenance works, the ride must be currentless, i.e. the main switch in the switch cabinet must be switched off. Should it be necessary to carry out maintenance work while the ride is in operation, an additional person to control the switch board is required.



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## II. ERECTION AND DISMANTLING

The amusement ride must be erected in the following sequence:

### Center Structure Trailer of Roadmodels

1. Drive the center structure trailer (1) with the rotating structure (2) exactly onto the center point where the ride is to stand.
2. Place wooden underlays (3) under the center structure trailer as per Drawing No. 2-17117.
3. Align the top edge of the center structure trailer horizontally 950 mm (37.4 inches) over the highest point of the terrain. To do this, operate the hydraulic lifting rams in succession; raise the structure only by short strokes and frequently switch to another lifting ram. If large differences in height have to be compensated, it is prohibited to bring only one hydraulic lifting ram to its end position without meanwhile evening up the structure with the other rams.
4. Securely underpin the center structure trailer with wooden underlays and remove the hydraulic lifting rams.
5. Hook on one stabilizer (5). Place wooden underlays (7) with a spindle prop (4) under the stabilizer.
6. If an erection crane (9) is available, hook the tackle of the crane onto the center of the trailer. Connect the hydraulic cylinders (10) with the hoses.
7. On completion of the erection work, detach the crane and hook in the second stabilizer.



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### Center Structure Trailer of Stationary Models

1. Set the center structure horizontally on the foundation produced in accordance with Drawing No. 1-19427. Pay attention to dimensional accuracy when positioning the center structure. It is also especially important to make sure that the height between the bottom edge of the center structure and the top level of the floor does not exceed or undershoot the rated dimension of 440 mm = 17 21/64".

If necessary fit shims with a central hole diameter of 27 mm under the anchor bolts.

2. Clean and wet the tubular holders for the anchor bolts.

Cast the M24 anchor bolts in concrete in the four corners and after the concrete has set, tighten the bolts with a torque of 200 Nm (148 ft lb).

3. Fit both stabilizers onto the center structure and place suitable support blocks or boards under the center structure in the area of the foundations.

### Illuminations Mast

8. Insert the arresting device (11) into the bottom fish-plates No. 1 on the rotating structure.
9. Bolt the illuminations mast (12) onto the rotating structure (2) with only two lugs in such a way that it points in the direction of the axis of the erection crane.
10. Fit the connecting pipe (13) between the mast (12) and the crane (9).



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11. Bolt the piping cage (14), the strut (15) and the illuminations strips (16) onto the mast and cable up the illuminations strips.
12. Carefully raise the mast to the perpendicular using the crane and bolt in position.
13. Remove the connecting pipe (13) and run the erection crane back to the starting position to assemble the booms.

#### Booms

14. Place boom No. 1 (17) on the crane (9) with the gondola arm (18) facing downwards and bolt to fishplates No. 1 on the rotating structure (2).
15. Place tie rods No. 1 (19) and No. 1a (19a) in the correct position on the boom and bolt onto the boom head (20) and (20a).
16. Raise the crane hook far enough to permit tie rods Nos. 1 and 1a to be bolted onto lugs Nos. 1 and 1a on the rotating structure.
17. Run the crane back to the starting position.
18. Remove the arresting device (11) from fishplates No. 1 and insert it in fishplates No. 2 on the rotating structure.
19. Assemble boom and gondola arm No. 2 as described in Points 14 - 16 above, reading No. 2 for No. 1.
20. Loosely bolt boom No. 1 to boom No. 2.



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21. Assemble all booms through to boom No. 13 in the same way.
22. Connect pressure rod (21) to boom No. 1 and boom No. 13 and adjust as necessary. Then fit boom No. 14 by the procedure described in Points 14 - 16 above.
23. When assembling the booms has been completed, remove or dismantle the crane, insert the pressure pipe (8) and remove the arresting device (11) from the fishplates on the rotating structure. Tighten all M24 connecting bolts (material 8.8) with a torque of 580 Nm (428 ft lb) and secure with safety locking pins.
24. Connect up the compressed air hoses after first having carefully cleaned the connection fittings and connect up the electrical cables.

#### Round Floor Structure

25. To assemble the round floor structure, four quarter-circle segments (22) must be laid out around the center structure trailer.
26. Connect the centering pipes (23) to the center structure trailer and the quarter-circle segments and fix in position with bolts. It is essential to secure the bolts on the center structure trailer against slipping out since the centering pipes (23) must not project beyond the top edge of the trailer.



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27. The height between the center point of the gondola suspension (24) to the bottom edge of the quarter-circle segments (23) is 1.82 m (71.65 inches), see Drawing No. 1-16910.
28. Make sure that the structure is absolutely horizontal and securely underpinned with wooden underlays (25) as per Drawing No. 2-17117.
29. Start assembling the platform supporting girders along the longitudinal axis of the trailer and fit the corresponding bracings (27) and connecting frames (28).

Pay attention to the identification labels.

Gondolas

30. Attach the gondolas (29) to their corresponding gondola arms in the correct order as marked (1 - 14) and tighten the M24 bolts with a torque of 200 Nm (148 ft lb) and secure with locking pins.
31. Fit the limiting rods (30) to the gondola arms and connect up the electrical cables.

Dismantling is exactly the same procedure in reverse order. In this case, it is especially important to make sure that all electrical cables and compressed air connections are disconnected in good time.

IMPORTANT !

We expressly draw attention to the fact that it is strictly prohibited to implement any changes in the wiring.

Incorrect connection of a single line or cable may entail unforeseeable consequences for the safety of the carrousel.

### III. Daily Putting into Operation and Shutting Down

#### Putting into Operation:

1. Check that all safety signs are put up in such a way that they can be easily read.
2. Check for the proper state of the tie rods.
3. Check that all bolts are properly secured by safety pins.
4. When establishing the electrical connections, check for correct phase sequence resp. direction of rotation of the electrical motors.
5. Close all open compressed air drainage valves.
6. Switch on the electric main switch.
7. Check the limit switch of the swinging as follows:  
Pull out one gondola at the time for approx. 15° - after 1,8 sec the respective control lamp at the rotating section must light up - now let the gondola arm slowly come back; at an inclination of approx. 10° the control lamp must go out again. Possible faults must immediately be repaired.
8. Grease the teeth of the ball-bearing slewing gear.
9. After approx. 30 hours of operation, inject ball-bearing grease into the lubricating nipples of the ball-bearing slewing gear.
10. Switch on both compressors.
11. Run at least 3 complete ride sequences with unoccupied gondolas using all control facilities and possibilities and at the same time check the support blocks. If the limit switches of the swinging do not function correctly (if the gondolas swing out too far), the cause must immediately be eliminated. After the trial runs have been successfully completed, commercial operation of the ride can be started.
12. All safety railings of the gondola must always be closed at all times during the ride sequence! The ride must not be accelerated beyond creeping speed until all persons standing on the entrance platform have left it!

#### Shutting down:

1. All drainage valves must be opened under pressure just before the compressors are switched off.
2. Switch off the compressors only after the ride has come to a standstill and lock the control panel.
3. Switch off the main power switch in the switchgear cabinet and lock the cabinet.

IV. MAINTENANCE AND LUBRICATION

(for operation in summer)

A) Carrousel Drive1. Drive Motor (31)

Three-phase current motor with full thermic protection. In dusty conditions, the motor should be blown through with dry air at regular intervals in order to remove deposits inside and at the ventilation apertures.

2. V-belts (32)

The four V-belts, type SPB, clear width = 3150 mm, in accordance with DIN 7753 Page 1, should be protected against heavy dirt. The tension of the V-belts is regulated by two tensioning bolts on the drive motor. For this purpose, the four bolts on the motor skid base must be slightly loosened. After every season, the V-belts should be checked and replaced if necessary.

3. Coupling (33)

The hydrodynamic start and safety coupling is filled with Automatic Transmission Fluid ATF and must always be operated with a constant oil level. The 8,25 litres of oil should be renewed after 4000 hours of operation (280 floz). There are appropriate filler nozzles and drain sleeves for this purpose.

4. Gearbox (34)

The gearbox is filled with 4 litres (135 floz) of SAE 90 gear lubricant oil. The oil should first be changed after 30 hours of operation, and subsequently after every 2000 hours of operation. There are appropriate filler nozzles and drain sleeves for this purpose.

5. Drive Pinion (35)

The pinion is mounted on a shear pin clutch. On overloading, four 12 Ø m 6 x 87 long pins of ST 52-3 steel shear off. These pins should be replaced by pins of the same dimensions and of the same material.

6. Live Ring (36)

The tothing of the live ring should be greased with MOLYKOTE 165 LT or ESSO-SURETT 30 toothed-gear grease approx. every day or as soon as bare patches can be observed on the tooth profiles.

The ball-bearing track of the live ring should be greased daily with ESSO-BEACON 2 roller bearing grease, or at least after every 30 hours of operation. For this purpose, there are four grease nipples marked yellow. Turn the bearing when greasing, i.e. push button for advancing.



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At regular intervals, check that the securing bolts of the live ring are firmly seated and tight. Use the torque wrench supplied with the ride. First undo the individual bolts and then tighten with 330 Nm (243 ft lb).

B) Carrousel Brake1. Brake Cylinder (37)

It is advisable to remove and dismantle the brake cylinder in order to clean it thoroughly after each season. Check the condition of the packings and exchange if necessary. All parts should be slightly greased before reassembly.

2. Bearings

All bearings should be slightly greased during the annual maintenance work.

3. Brake Blocks (45)

The two brake blocks have a riveted brake lining, 140 x 10 x 630 long, which should be renewed at regular intervals.  
Necessary rivets: 34 rivets, B 6 x 18, DIN 7338 - Cu.

C) Pneumatic System

## 1. Two compressors are incorporated in the ride, see the enclosed special instructions for service and maintenance.

2. Oil and Water Separators (38)

After several hours of operation, open the drainage valves of the separators under pressure to release the resulting oil and condensate. At regular intervals dismantle and clean the separators.

3. Condensate Section (39)

The condensate from the pneumatic system should be drained off after several hours of operation by opening the drainage valve.

4. Pneumatic revolving joint (40)

The pneumatic revolving joint is located at the base of the axle of the rotating section and has maintenance-free bearings of artificial carbon. The bearings should be renewed when they are no longer tight.

5. Pneumatic Cylinders (41)

The fourteen pneumatic cylinders with magnetic control valves are made entirely of non-rusting material and designed for operation without oil. After each season, i.e. after approx. 1000 hours of operation, we recommend that the inside of the cylinders be thoroughly cleaned. At the same time, check the piston collars and sealing rings and exchange if necessary. All parts should be slightly greased before reassembly.



D) Gondola Arm Bearing and Switch Element

1. Gondola Arm Bearing

The gondola arms (18) are suspended in the heads of the booms (20) and (20a) by means of two flange bearings each. Each flange bearing incorporates one self-aligning bearing with roller bearing lubricant, sealed with a collar. Subsequent greasing is possible. The flange bearings should be dismantled after approx. 6000 hours of operation in order to clean the bearings and to refill with ESSO-BEACON 2 roller bearing lubricant.

2. Switch Element to Control the Pneumatic Impulses

The switch element on the gondola arm crosshead (42) is situated in the head of the boom. Its function is to activate a terminal switch when the swing reaches its turning points. For this purpose, the switch element has two two-piece friction disks, which enable the indexing disk to be carried to its end position. No lubricants may be used in the area as they would alter the friction values. The thickness of the friction disks is to be checked at regular intervals. When the thickness is 4 - 5 mm (0.16 - 0.20 inch), the disks must be replaced by new 8 mm thick (0.32 inch) friction disks. To do this, it is only necessary to press back the pressure disk.

E) Hydraulic Assembly Crane

1. Pump Aggregate (43)

The aggregate has an oil filling of 20 litres (0, 7 ft<sup>3</sup>) ATF. The pump must never run without oil filling. Oil must be refilled as soon as the oil-level gauge shows that the oil-level is in the lower range.

2. Valves (44)

For activating the hydraulic cylinder a hand valve for reversing the up and down movement has been incorporated. There is a throttle valve in the return pipeline of the hydraulic cylinder to regulate the lowering speed of the crane. The optimal adjustment has been made in the factory. The installation resp. the hydraulic oil must be carefully protected against dirt.

**A T T E N T I O N !**

Check that the tensioning rods, items (19) and (19a) are firmly in position and tight at regular intervals, at least every 2 weeks. If necessary, re-tighten to 150 Nm (110 ft lb). To do so, loosen the counter-nuts and make sure that the tensioning rods cannot be twisted.

Attention !

If the ride shall be operated at temperatures below 0°C, i.e. below the freezing point of water, ask HUSS for advice regarding the pneumatic system.



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V. SAFETY REGULATIONS

for

Amusement Ride "SWING-AROUND"

1. The ride must be erected so that the rotating section with gondolas in all swinging positions maintains a sufficient distance from buildings, trees, electrical cables or other objects so that passengers are not endangered.
2. The base frame and its 2 cantilevers must be underpinned at the foot plates according to drawing no. 2-17117 "Holzunterfütterung" - underpin with wood). The plates necessary for underpinning have been supplied by the manufacturer and according to the indicated sizes.
3. The safety valve of the pneumatic system must always be adjusted to the highest permissible pressure of 10,0 atü (145 psi). In addition, the pressure must be checked several times per day during operation.
4. The maximum payload in each gondola is 150 kg (330 lb.), i.e. 2 adults or 3 children.
5. Children under 8 years of age and of a height of less than 137 cm (4,5 ft) may only use the ride accompanied by a responsible adult (in this case one responsible adult must only be accompanied in the gondola by one child).
6. The passengers must be distributed as evenly as possible among the gondolas and the rotating units.
7. The operator must not switch on the rotating section until
  - a) all passengers are properly seated in the gondolas and after all gondola safety bars have been locked and
  - b) the public have left the entrance platform.
8. At the beginning and the end of each ride sequence, the cashiers must check that their individual ride section has been cleared of people and that nobody enters the platform during operation. If, due to a large crowd, it cannot be ensured that the platform is cleared of people, the fences must be closed and entrance and exit must be controlled by supervising personnel.

Drunken persons are not to be permitted to the ride.
9. After the ride has been erected and prior to daily putting into operation, the limit switch of the swinging of all arms must be checked in accordance with the Operating Instructions.
10. The operation stand with all control devices has to be positioned outside the rotating section at a place with a good view on the entire ride. There must be a minimum distance of 50 cm (20 inches) between the operation stand resp. cash-booth and the widest gondola swing.



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11. Prior to every erection, all carrying and motor driven parts are to be checked on their perfect condition. Defective parts must be immediately substituted by perfect ones. Check that the ride is stable also during erection and dismantling. After erection has been completed, all parts must be orderly connected and all connecting elements must be securely installed.
12. All connecting elements of the ride must be secured by suitable means against unintentional loosening.
13. Prior to starting daily operation, the ride must be checked for secure functioning. The important connections and the movable and motor driven parts must be controlled during operation as well.
14. At several prominent places, notices have to be displayed informing the public about permissible loads and the minimum age of accompanying children. Furthermore, these notices must show that it is forbidden to lean out of the gondola, to smoke, to enter the gondola with animals and umbrellas, sticks and other bulky or pointed objects.
15. All factory settings and adjustments made by the suppliers must not be changed. Upon request, an acceptance certificate will be submitted.
16. The instructions of operation and maintenance of the individual manufacturers must be observed.



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VI.Maintenance Instructions for Fiberglass Surfaces

We use only first-class materials to produce the surface finish of our fiberglass components. Although these require very little maintenance, they cannot do entirely without maintenance. To retain the brilliant surface gloss for a long time we recommend you to:

1. Clean the surfaces at least every 14 days with clear water and then polish with a leather cloth.
2. Never rub dust or dirt off the surfaces when dry.
3. Clean the surfaces with a solution of water and household washing-up liquid or similar as required but at the latest every 3 months; after drying, apply a good automobile wax and polish with a soft cloth.
4. If you use a high-pressure steam jet, never work with chemicals which are more aggressive than soapy water.
5. If you use a high-pressure steam jet with chemicals which comply with Point 4. wax and polish the surfaces again afterwards.
6. Stubborn spots and stains can be swiftly removed with moist acetone cloths; keep the contact time with acetone to a minimum.  
Immediately after working with acetone or cleaning benzine, wash the surface well with clear water and then wax and polish.