MAN-CO MFG., INC.

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Mfg: MANCO PRODUCTS
Name: ROUND UP - PARK
Type: non-kiddie

DAILY INSPECTION CHECKLIST ROUND-UP

1. Check blocking, outriggers and landing gears
2. Check leveling
3. Inspect steps and handrails - check clearance to platform
4. Inspect outside fence and fence jacks
5. Check snap keys on a.) platform fence posts; b.) cage turnbuckle rods; c.) rim pins
6. Check snap keys on scenery panels
7. Check safety chains and snaps on cages
8. Inspect center panels and snap keys
9. Check electrical connections and plugs
10. Inspect drive belts and belt guards
11. Inspect hydraulic hoses for leaks
12. Check hydraulic oil tank level
13. Inspect drive mount turn buckles, pins, and snap keys
14. Inspect cage head cushions
15. Inspect drive wheel tires
16. Check brake operation
17. Inspect safety valve linkage and limit switch. Ride should not exceed 70°
18. Operate Round-Up through one complete ride cycle of proper operations. Ride should run at 18 RPM maximum (16 RPM for Super Round-Up)

SUPER ROUNDUP

OPERATION
&
MAINTENANCE
MANUAL

P.O. Box 12768
Salem, Oregon 97309
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INTRODUCTION

This manual is intended to be used as a general guide for the operation and maintenance of your ride. Kilinski Manufacturing Co. is constantly striving to improve performance, efficiency and safety; therefore, certain improvements may not be reflected in the text of the manual. Any major revisions or additions to the manual will be sent to you free of charge. Specially engineered features purchased for individual rides may not be incorporated in the manual.

WARRANTY

Kilinski Manufacturing Co. does hereby warranty all parts and materials which are manufactured by us against failure under normal use and service for a period of one hundred eighty (180) days after the date of sale. Under these conditions, all such parts and materials will be invoiced to the customer upon shipment by us of required replacement parts. Full credit will be allowed on such parts subject to the following conditions:

(A) If they are returned to us, freight PREPAID, within a period fifteen (15) days after date of invoice.

(B) After our examination of said parts they prove to our satisfaction that such defects did exist. This is our sole obligation under this warranty.

On parts which are purchased and not manufactured by Kilinski Manufacturing Co., the original manufacturer's warranty will apply. However, the same policy as above does exist if replacements are ordered and shipped by us.

It is our desire to serve our customers promptly and efficiently; however, the laxity of some of our customers in returning warranty parts has brought about this policy which must be adhered to unless other arrangements are made in writing with an official of our Company.

SPECIFICATIONS

CAPACITY	To 900 passengers per hour
SEATING	42 passengers (standing)
LIGHTING	1,794 incandescent lamps or 1,008 incandescent lamps 64 6-foot fluorescent lamps 32 4-foot fluorescent lamps
TOTAL POWER REQUIRED	Approximately 30 KW
AREA	54 feet deep x 48 feet wide
MAXIMUM HEIGHT	Approximately 50 feet
WEIGHT	Approximately 36,000 lbs.

THE SUPER ROUND-UP PARK MODEL FEATURES:

- 3 phase motors - 208/230/460 volt
- Complete Deluxe Lighting — all incandescent lights or a combination of incandescent and fluorescent lights
- Entrance and Exit ramps
- Electric Safety Doors

Table of Contents

LIST OF INCLUDED ILLUSTRATIONS

I. INSTALLATION:

A factory service representative is provided with each Super Round-Up to assist with the installation and start-up of the ride. The ride is shipped in two shipments. The first shipment consists of the basic frame and boom assembly. Included in this assembly are the drivers, the hydraulic system, the elevator rams, the center ornament, the outrigger side supports, and the center wheel hub assembly. The second shipment includes the sweep arms, the passenger cars, panels, lighting and other miscellaneous parts.

A. Installation of Main Frame and Boom Assembly

A twenty ton crane should be used for the unloading and positioning of the main frame and boom assembly. Four outrigger attachment points, two on either side of the ride, are provided. These should be used as the pick-up points for positioning.

Prior to installation of the ride, pour the concrete foundation pads as indicated on the "space diagram" provided by the factory. Care should be taken to keep the surfaces of these pads as level with one another as possible to minimize shimming to level the ride. After the pads are properly cured, position the main frame and boom assembly over the pads.

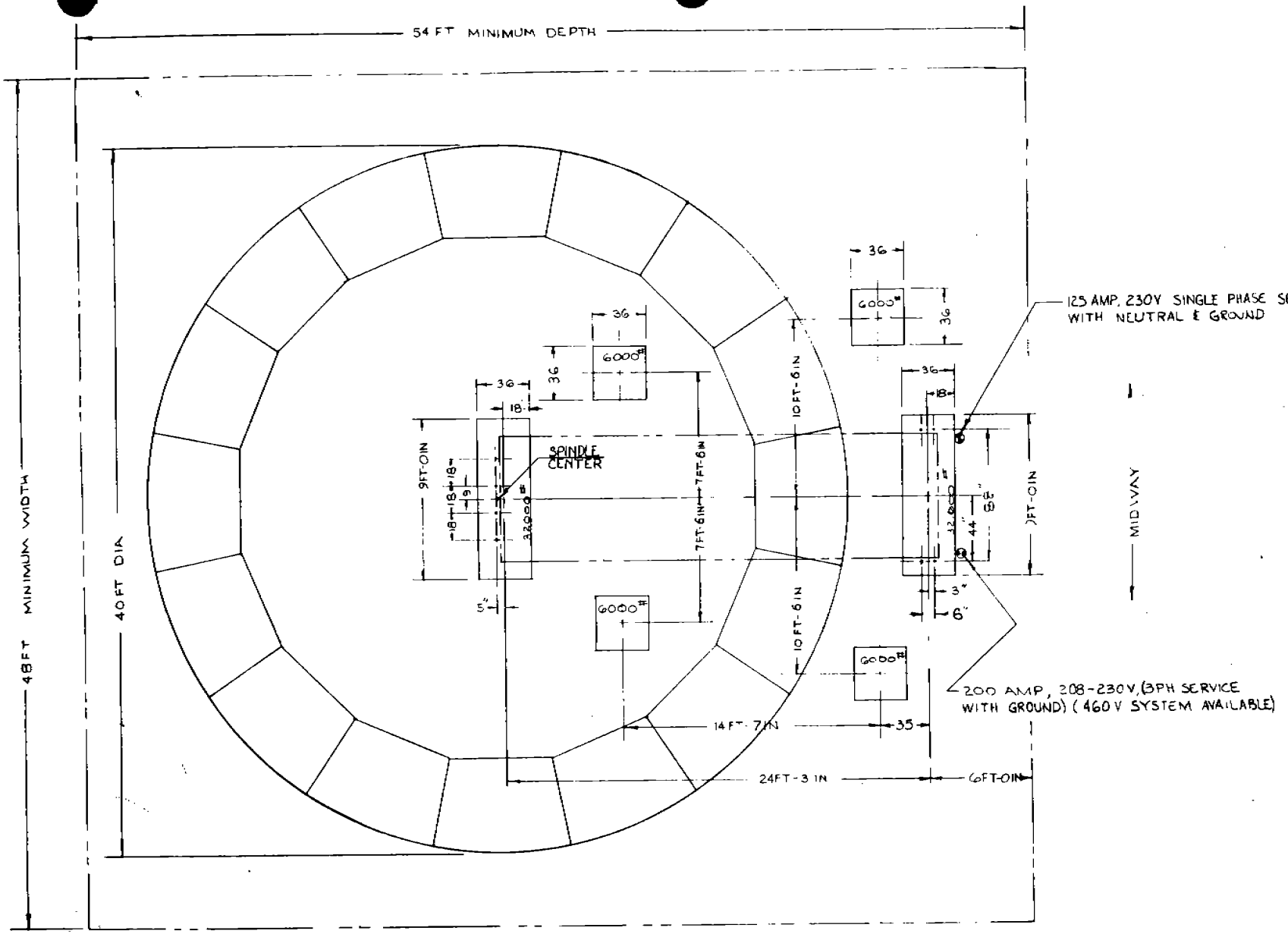
The spindle, boom and main pivots have all been leveled with the main frame at the factory. It is very important to install the main frame level on the pads. Shim where necessary. The ride is "clamped" in place with eight (8) clamping bars, four (4) at the front and two (2) on either side at the rear. Bolts should be poured in the concrete pads per the space diagram for this purpose. Install the outriggers with the pins provided and safety key.

B. Electrical Service Hook Up

Two electrical enclosures are provided on the ride. One houses the motor controls and the other contains the lighting controls. Three phase power and a ground should be brought into the motor control enclosure and wired to the MC main breaker. The lighting controls are designed to be powered by single phase, 220 volt, three wire service. A MC main breaker is provided as a contact point in the lighting enclosure with the center pole as neutral. This single phase power is internally split into two basic 110 volt systems. All wiring integral to the ride is wired at the factory prior to shipment with handy plugs located for ease of installation. Specific regional requirements or customer preference may cause various modifications to this arrangement. After electrical service is provided to the ride and the "control console" has been installed (discussed later), the "stop-start" controls on both "drive" and "pump" should be instantaneously *pulsed* to determine that the motors rotate in the proper direction.

Main Wheel Rotation: It is recommended that the main wheel assembly be rotating in a clockwise rotation when in an elevated position and viewed by the operator from the main pivot end of the ride. This is not an absolute requirement. A counter-clockwise rotation can be used if it would better meet park situations. Consult the factory with any questions.

Hydraulic Pump Rotation: An arrow is provided on the hydraulic pump to indicate the proper pump rotation. The motor shaft (on the pump/motor combination) should rotate counterclockwise when viewed from the pump end of the assembly. DO NOT OPERATE THE PUMP IN THE WRONG DIRECTION. The direction of the motor can be reversed by changing any two power leads.



REV.	DATE	DESCRIPTION
A	AUG [illegible]	[illegible]

KILINSKI MFG. COMPANY

40 FT-R-UP SPACE DIAGRAM

DATE 4-20-72
DRAWN BY SMR
SCALE 1/4" = 1'-0"

NO SR-511

C. Description of Major Assemblies:

Refer to Figure #2 for an illustration of these various assemblies and their location on the ride. Several major assemblies are attached to the main frame and boom assembly which is the first shipment you will receive.

1. Drive Assemblies:

Two 7½ HP drive assemblies are pivoted from a mount on the boom. Drive is accomplished through two 5.20 x 13 tires running along the outside circumference of the main wheel assembly. Each drive includes a primary and secondary V-belt system, hydraulic drum brake, and a hydrosheave for smooth starting. The motor belts are removed and the drive assemblies rotated on their pivots to the center of the ride for shipment.

Replace the motor belts being careful not to overtighten. After the ride has been in operation for a-while the belts may stretch. It may be necessary to readjust them.

Rotate the drive assemblies to the outside. After the main wheel has been assembled, attach the turn-buckles to the drive mount and tighten the tire to the rim until slippage at "start-up" and "braking" is at a minimum.

2. Center Hub Assembly:

The center hub and bearing assembly located on the spindle at the end of the boom is completely assembled at the factory. The bearings have all been greased. The "sweep arms" and "center light ornament" will mount to the hub. Three small electrical breaker boxes are located on the hub and are wired to the commutator rings beneath the bottom hub plate. Electrical plugs are located on these boxes for connecting the sweep and car lights.

3. Control Console:

The control console is a small enclosure housing the controls used by the ride operator during normal ride operation (See Fig. #3). The control console and stand are portable and can be located anywhere within a radius of the control cable for remote operation of the ride. It is recommended that the control stand be located at the entry for passenger control as well as good visibility. When the ramps are used, the controls are often mounted right on the entry ramp by modifying the stand. Connect the wires from the console to the appropriate terminal in the motor control enclosure as indicated on the wire leads. The brake control lever is located on the side of the mount post. The brake control cable should be attached to the control lever. Connect the other end of the cable to the brake system master cylinder. The master cylinder is located on the left upright of the main frame near the main pivot.

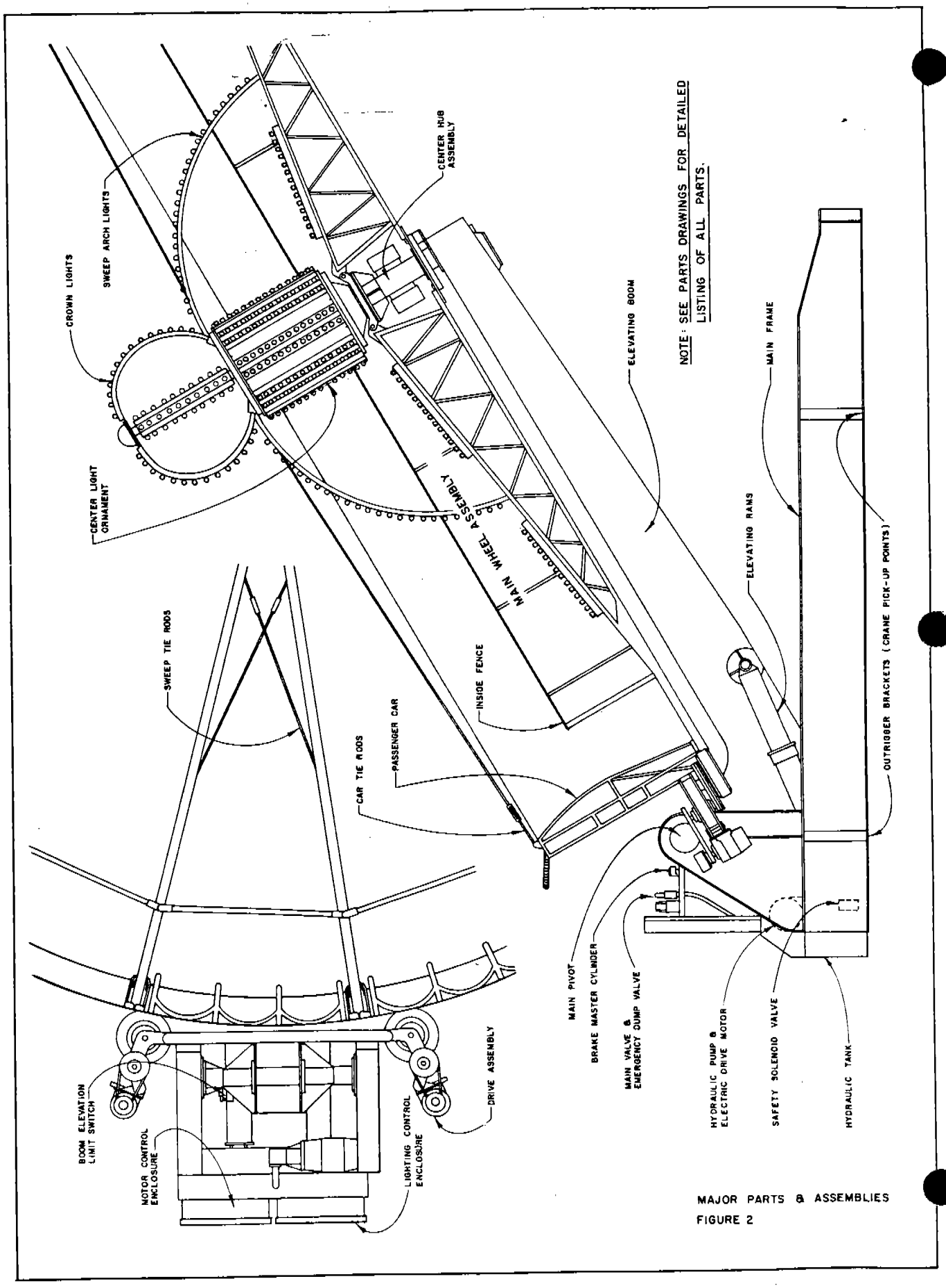
4. Hydraulic System:

The hydraulic system includes the 30 GPM pump, main directional control valve, pressure relief valve, safety solenoid valve, emergency "dump" valve, two elevating hydraulic rams, two metering valves, the main tank and necessary plumbing. The system is shipped complete and has been tested at the factory. The only start-up procedure involving this portion of the ride is to check the rotation on the pump (see above "electrical").

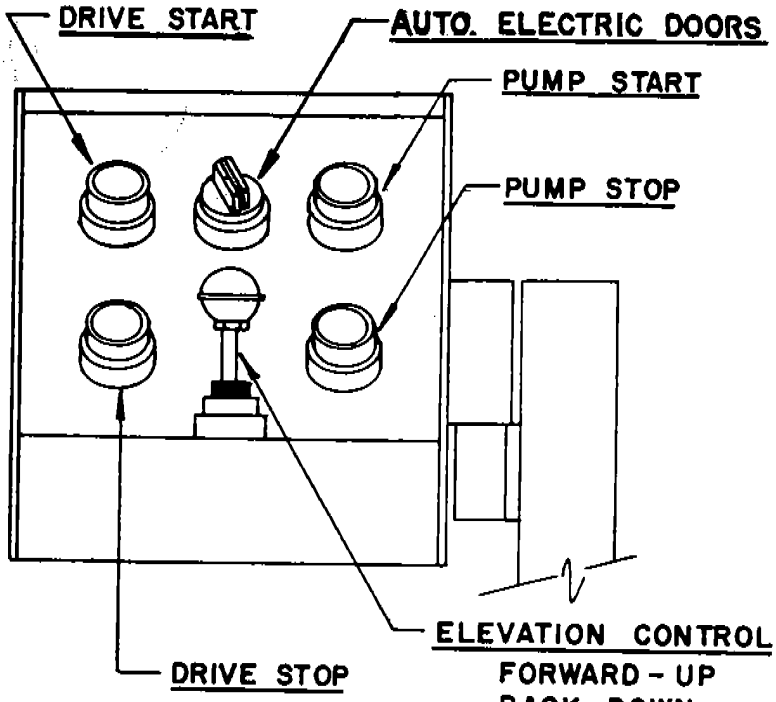
Consult the factory before making any adjustments to this system.

5. Sign:

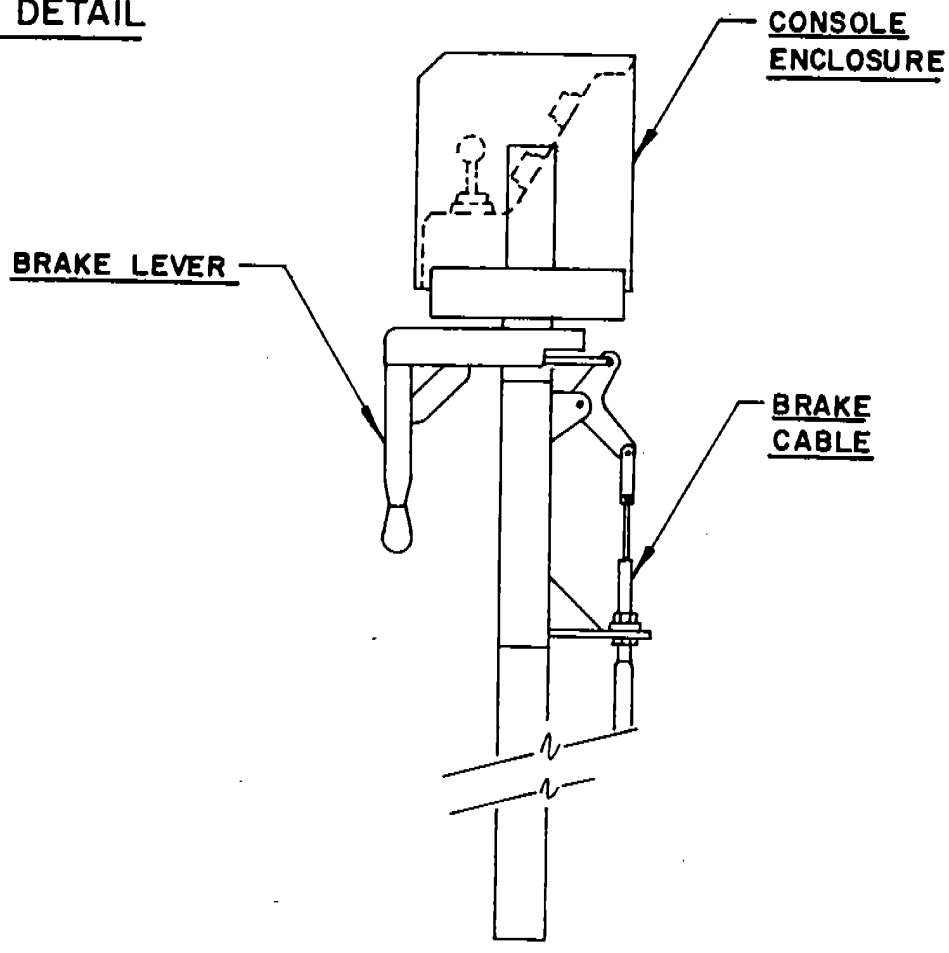
The sign is shipped completely wired to the lighting enclosure. Do not remove the protective plywood cover provided for shipment until the ride has been completely assembled and ready for testing.



MAJOR PARTS & ASSEMBLIES
FIGURE 2



CONSOLE DETAIL



CONTROL CONSOLE

FIGURE 3

D. Assembling the Remaining Parts:

The remaining parts to be assembled (with the exception of the center ornament included in the first shipment) are included in the second shipment and should be assembled with the assistance of the factory service representative.

1. **Sweep Arms:**

   Sixteen (16) sweep arms are supplied. Each sweep is numbered and a corresponding number is stamped on the center hub assembly at the point where each sweep is to be installed. Failure to match the index numbers could result in an uneven outside circumference on the main wheel assembly. This could create drive difficulties. The holes in the bottom of the sweep at the hub end slip over the pins in the bottom hub plate. Pin the top of the sweep in the clevis on the top plate with pins provided and install cotter pins.

2. **Automatic Doors:**

   The two automatic door assemblies are 180 degrees apart. Each is positioned counterclockwise to a sweep that is equipped with electrical attachments. Bolt the doors to the blank rim sections. Connect the wires that extend from the ends of the sweeps with those in the junction boxes on the doors. Match the wire colors according to wiring diagram # SR 504. Connect the electrical attachments on the two sweeps to the electrical outlets on the center hub.

3. **Passenger Cars:**

   Fourteen passenger cars and two "blank" rim sections (entry and exit) are supplied. Install the cars with the bolts provided for this purpose. The 1" x 6" long, Grade #5 bolts are installed vertically to hold the cars and rim sections to the sweep. Two are installed at each sweep. The ⅞"x8" long, Grade #5 bolts are installed horizontally through the sweep. One is installed on each sweep. The two blank sections must be installed directly opposite each other to maintain proper balance on the main wheel assembly. The 8 inch long bolts tie each rim section together to reduce vibration and noise on the cars and the blanks. Install the 8 inch long bolts, but DO NOT tighten; leave them very loose at this time. With the rim assembled, position the drives, install drive tighteners (turn buckles) and adjust the tire to the rim. The tire is set at the factory to run just below center on the outside rim.

4. **The Center Light Ornament:**

   The center ornament should be positioned on the center hub so that the sweep arms with the arch light sockets (every other one) are in line with the mounting holes for the arch lights on the outside rim of the ornament. After the center ornament and cars are installed, attach the car tie rods from the top of the cars to the upper outside rim of the center ornament. This tie rod should be hooked on the car to the inside of the bracket with the stub end and keeper pin on the outside away from the passenger area.

5. **Walkway and Fence:**

   Install the walkway boards and fence at the same time. The bracket on the lower part of the fence will support the inside edge of the walkway. Each fence pin will support the end of two fence sections.

6. **Lighting:**

   The sweep light fixtures should be installed along the top of the sweeps and pinned for safety. The incandescent light bulbs are shipped separately to protect them. Install the bulbs in the arch lights on the sweep and on the upper outside of the cars. Install the center support column for the crown lights above the center ornament. Install the crown light fixtures and install the bulbs in the center column and crown. The entry/exit lights and vertical light fixtures on the cars can be installed anytime after the cars are in place.

7. **Decorative Panels:**

   Install the decorative panels between the sweeps in the brackets supplied along the upper part of the sweep arms. With the two sections installed in each wedge shaped section, drill through the upper bracket, the panel corner, and the lower bracket with a 9/32" drill. Install a ¼" bolt to keep the panels in place.

8. **Sweep Tie Rods:**

   After all the panels are in place and tied down, install the sweep tie rod braces. These are installed in

a criss-cross arrangement on the pins provided on the lower part of the sweeps. Install safety pins and tighten to bring main wheel assembly into a circle. After the tie rods are installed tighten the horizontal tie bolts (8" long) between the cars.

9. Entry and Exit Ramps:

Assemble the ramps and position along the circumference of the main wheel. The ramps must be 180 degrees apart to align with the automatic doors. The normal positioning is to place the entrance ramp directly to one side of the main frame near the main pivot, with the exit ramp directly opposite the wheel. Some operators prefer some other arrangement. The ramps are designed to be installed with the tops of the ramps running under the rotating platform. There should be an approximate eight inch step up from the ramps to the rotating platform.

II. OPERATION:

A. Description:

The Super Round-Up is a ride designed to accommodate up to forty-two (42) passengers. The pessengers stand in a vertical cell located along the circumference of the forty foot (40') diameter main wheel assembly. The passenger stands facing the center with his back to the cushion, feet on the deck and the security chain fastened at waist height in front of him. After checking to be sure that everyone but passengers are off the ride and the entry/exit ramps, and that all passengers are properly secured, the ride operator makes sure the hydraulic pump is in operation and starts the "drive". The main wheel should begin to rotate and in approximately twelve (12) seconds it will reach a maximum speed of 16 RPM. The operator actuates the "Boom Control" which will elevate the main wheel in an arc around the main pivot until it reaches an angle of approximately seventy degrees. The main wheel will stop automatically at this factory pre-set elevation angle and remain there until the operator brings it down. The operator lowers the main wheel by operating the Boom Control in reverse. The main wheel will lower to loading position. The operator de-energizes the drives by actuating the "stop" switch and "brakes" the rotation by use of the brake lever. Care should be taken to bring the main wheel to a complete stop so as to locate the entry and exit directly in line with the ramps. This will not be difficult after a little practice. The passengers disembark, new passengers are loaded and the procedure is repeated.

B. Controls:

1. Control Console:

All of the main controls required for normal operation of the ride are located in the control console. The console mounts on a steel post with the brake controller. As described in the "installation" section, the console is generally located on the entry ramp. The drive control, hydraulic pump control, and the boom elevator control are mounted in the console (See illustration #3).

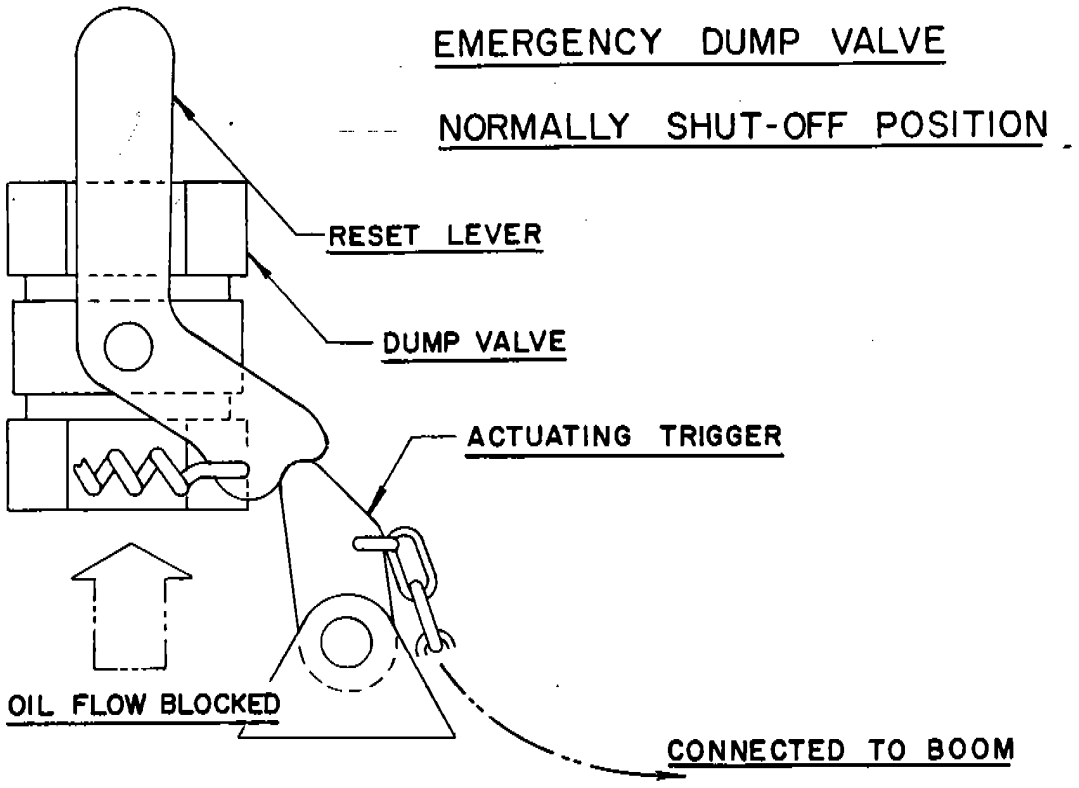
a. DRIVE CONTROL: The push botton stop/start drive control switches operate the magnetic motor starter in the motor control enclosure. The drive is started and stopped with each ride cycle. Overload protection with manual reset is included on the motor starters.

b. HYDRAULIC PUMP: The push button stop/start "Pump" control switches operate the magnetic motor starter in the motor control enclosure. Under normal operation where the ride will be operating on a continuous basis, it is not necessary to start and stop the hydraulic pump between ride cycles. The operator will normally start the pump and leave it running until the ride is to be down for some time. Overload protection with manual reset is included on the motor starters. Because of electrical safety interlocks, (discussed in detail later) if the pump is shut down either by the operator or by the overload protection, the main wheel and boom, if in an elevated position, will automatically descend to load position.

c. BOOM ACTUATOR SWITCH: The main wheel and boom are raised hydraulically by rams. Control of the raising and lowering of the main wheel is through a solenoid operated control valve. This valve is operated by a three position "joy stick" electrical switch located in the console. When the main wheel rotation has reached 16 RPM the operator pushes the "stick" forward which electrically operates the main valve and the main wheel and boom will elevate. If the operator releases the switch it will return to center neutral position. The main valve will then also return to neutral position and the boom will stop in that position. For best entertainment value, the operator should hold the "stick" in the elevating position until the ride has reached the factory pre-set maximum elevated position. The boom will actuate a limit switch located near the main pivot and the signal from the "stick" on the console to the main valve will be interrupted causing the valve to return to neutral position. At this point, operating the "stick" to *ELEVATE* the boom further will have no effect. After the desired ride duration the operator pulls the "stick" toward him. This will cause the main valve to operate in the opposite direction and the main wheel and boom will begin to return to normal load position. Again, the operator should continue to hold the "stick" as releasing it will cause the main wheel and boom to stop.

d. BRAKE: The brake control lever is located on the side of the console mounting post. This lever operates a hydraulic master cylinder through a control cable. The hydraulic master cylinder controls two drum brakes mounted on the drive assemblies.

e. AUTOMATIC DOOR CONTROL SWITCH: The automatic doors are controlled by a two-position switch. The door switch controls a solenoid activated lever on the boom, which in turn trips one of the two limit switches on the lower hub plate. To open the doors, turn the switch to "OPEN". The doors will not open until the ride is fully stopped and the doors are properly aligned with either of the entrance-exit ramps. To close the doors, turn the switch to "CLOSE". The ride cannot be started until the control switch is at the closed position.



OPERATION

IF THE BOOM SHOULD ELEVATE BEYOND THE FACTORY PRESET MAXIMUM HEIGHT, THE CHAIN CONNECTION WILL RELEASE THE TRIGGER AND THE SPRING WILL OPEN THE DUMP VALVE WHICH WILL ALLOW ALL THE HYDRAULIC OIL TO RETURN TO THE TANK. THE MAIN WHEEL WILL DESCEND AND IT WILL NOT BE POSSIBLE TO ELEVATE IT UNTIL THE DUMP VALVE IS RESET.

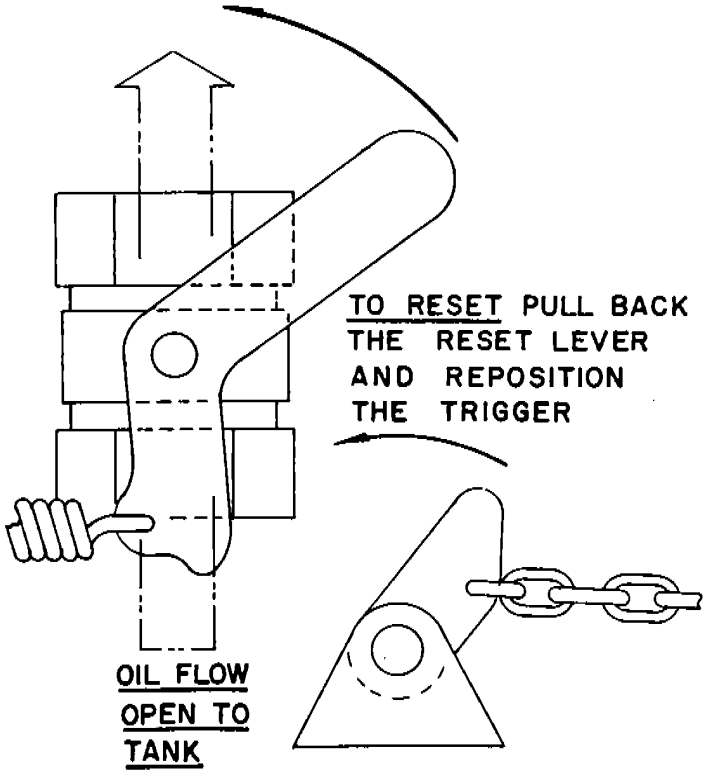


FIGURE 4

2. Safety Interlocks:

The Super Round-Up is equipped with safety devices to give the maximum protection against accidents. The three prime safety interlocks are "Emergency Dump"; the "Starter Interlock"; and the "Speed Interlock".

a. EMERGENCY DUMP: The emergency dump is a mechanical interlock to insure against the main wheel and boom being elevated beyond a safe height. The emergency dump consists of a globe valve with a spring loaded trigger mechanism (see illustration). If the electrical elevation limit switch should fail and the operator continued to raise the boom past the recommended 70° maximum, the boom will mechanically trigger the emergency dump valve. Should this occur, all of the hydraulic oil from the rams and from the pump will pass directly back to the tank causing the boom to descend to the load position. *THE OPERATOR WILL NOT BE ABLE TO ELEVATE THE BOOM UNTIL THE EMERGENCY DUMP VALVE IS RE-SET.* At this time he should also check the electrical limit to determine why it malfunctioned.

b. STARTER INTERLOCK: The Super Round-Up is equipped with a safety solenoid valve in the main hydraulic line to the rams. This valve is a normally open valve closed by an electrical signal. This valve serves several safety functions and is critical to the normal safe operation of the ride. The electrical pilot signal to this valve is wired through the auxiliary contacts in the magnetic motor starters for the drive and the hydraulic pump motor. Should the overload protection on any starter "kick-out" that starter, the signal to this valve will be interrupted and the valve will open. If this occurs, all of the hydraulic oil in the rams and from the pump will return directly to the tank. When this happens, the boom (if it is elevated or being elevated) will descend to the normal loading position. It will not be possible to elevate the boom until the motor starters have been reset. The "starter interlock" will also be actuated automatically if for any reason electrical power to the ride is interrupted. In event of a power failure the main wheel and boom will immediately descend to the normal loading position.

c. SPEED PROTECTOR: It is imperative that the main wheel speed of 16 RPM be maintained while the main wheel and boom are elevated. Passengers are held in place by centrifugal force and the speed is critical to their safety. Each Super Round-Up is equipped with one or two possible "Speed Protector" electrical interlock systems. A brief description of each of these systems follows. Only one is used on each ride. The selection of the most appropriate system is determined by the factory and is based on various criteria involving the ultimate installation and use requirements.

1. *Speed Protector Timer:* In the "timer system" an electro/pneumatic timing relay is used. This timer "short stops" the electrical signal from the control console to the main valve for a predetermined factory pre-set interval. This time delay insures that enough time is allowed for the main wheel to reach the 16 RPM before the main wheel and boom can be elevated. The timer is wired with the "Starter Interlock" system. If a failure in the electrical system occurs, the main wheel will return to load position and it will not be possible to elevate it until proper steps have been taken.

2. *Speed Protector Sensor/Counter:* In the "Sensor/Counter System" a proximity sensor and control relay combination are incorporated in the electrical circuit. Eight small square metal "targets" are attached to the bottom plate on the center hub assembly of the main wheel assembly. As the main wheel rotates, a proximity sensor mounted to the boom very close to the target detects the passing of each target and signals the control relay located in the motor control electrical enclosure. By determining the interval between "target signals" the control relay can determine the rotation speed of the main wheel. The control relay is wired to the normally open solenoid hydraulic interlock valve (see "starter interlock") in the hydraulic line to the rams. When the main wheel rotation has reached the factory pre-set speed (16 RPM) the control relay will close the interlock valve and the hydraulic oil can be directed to the rams to elevate the main wheel and boom. If for any reason, electrical or mecanical, the main wheel rotation should drop below 16 RPM the control relay will detect the change in speed and open the interlock valve automatically causing the main wheel and boom to lower to the normal loading position.

3. *Enclosure Controls*: Two separate electrical enclosures are supplied on the Super Round-Up. One for the motor controls and the other for "lighting" controls. Various switching is located on the face of these enclosures.

   a. Main Control Power: A "MC" main breaker switch is mounted on the motor control electrical enclosure. Throwing this switch will disconnect all power in the enclosure below the fuses.

   b. Motor Reset: Reset buttons are included on the enclosure for each motor. In the event of an overload situation, the overload protectors on the magnetic motor starters will open. It will be necessary to re-set them by depressing these buttons in order to operate the motors.

c. Light Breaker: A "MC" main breaker switch is mounted on the lighting control electrical enclosure. This is the light "on/off" switch for the decorative lighting throughout the ride.

3. Automatic Door Safety Features:

a. SAFETY TAPE SWITCH. The safety tape switch is located on the leading edge of the door. It is actuated by depressing the edge of the door. When actuated, the safety tape switch will stop the closing action of the door.

b. SAFETY SLIP CLUTCH ON THE DOOR ACTUATOR. The door actuator is located on the door. In case of safety tape switch failure, the safety slip clutch is set to prevent the door from exerting more than 40 pounds of pressure against an object.

c. TWO LIMIT SWITCHES ON THE DOOR. The limit switches start and stop the motor that opens and closes the door. The switch near the back edge of the door controls the opening action. It will stop the motor before the door contacts the framework. The switch near the leading edge of the door controls the closing action. It will stop the motor just as the tape switch contacts the framework.

d. TWO LIMIT SWITCHES ON THE CENTER HUB. The limit switches activate the doors. These switches are controlled at the operator's console. In order to activate the switches, the ride must be at a full stop, and the doors properly aligned with the entrance-exit ramps.

C. Operation Instructions:

1. Before starting the ride, turn the electric door switch to "CLOSE". The door must be completely closed before starting the ride.
2. Push the drive start button to start rotation. Allow about 15 to 20 seconds for the ride to come up to speed (approximately 18 RPM).
3. Push the pump start button.
   NOTE: The pump motor will not operate unless the drive motor is on. A time relay prevents the pump from raising the boom before the drive motor has been operating for 15 to 20 seconds.
4. Push the elevation control lever forward to raise the boom. Hold the lever forward until the boom reaches maximum height. At maximum height elevation will automatically stop. Release the elevation control lever.
5. To lower the boom, pull the elevation control lever back until the lowering action is automatically stopped.
6. Push the pump stop button.
   CAUTION: Do not turn the pump motor off while the boom is elevated. In the event the pump motor is turned off while the boom is elevated, the cylinder solenoid dump valve will automatically cause the boom to descend.
7. Push the drive stop button.
8. Use the brake to slow the ride by pulling the brake lever up. Use a gradual easy pressure. Avoid trying to jam the ride to a stop by applying too much pressure to the brake lever.
9. Bring the ride to a full stop. Align the doors with ramp areas.
   NOTE: The doors will not open before the doors are aligned with the ramps and the ride is completely stopped. Either door may be aligned with either ramp.
10. Turn the door switch to "OPEN" to open the doors.
11. The recommended ride cycle, from loading to unloading, is 2½ minutes.

D. Operation Safety Recommendations:

1. Station operators at the exit-entrance areas to assist in riders loading and unloading, and to control the activities of the riders on the ride.
2. Place riders evenly around the ride for proper wheel balance, when not running at full capacity.
3. All riders must wear shoes.
4. Do not allow riders to board the ride with carry-on equipment (cameras, pop bottles, etc.) that may fly out of their hands during the operation of the ride.
5. Allow one rider per cell.

6. Riders must be tall enough for their heads to meet the headrests.
7. Overweight people who cannot easily fit into the cell, with the chain locked across the front, must not be allowed to ride.
8. Riders ride in a standing position, feet firmly on the platform, with their backs against the cell wall. At no time are riders allowed to climb up the side of the cell, sit down, or in any way ride in any posture other than the recommended standing position.
9. All chains must be fastened in front of the riders.
10. Before starting the ride:
    a. Be sure all riders are properly in place with chains locked.
    b. No riders walking around on the platform.
    c. No loose foreign objects on the platform.
    d. No individuals near the exterior of the ride, who could come in contact with the rotating platform.
11. Keep your eyes on the ride at all times. Be alert.
12. If the behavior of any rider is erratic, or a rider moves himself out of the recommended riding position, stop the ride.
13. All riders must remain in their cells, in recommended riding position, with chains locked, until the ride comes to a full stop and the doors are open.

Additional controls may be necessary to meet individual customer requirements. Consult the factory for additional information. *ALWAYS CONSULT THE FACTORY BEFORE CHANGING THE WIRING OR MAKING ADJUSTMENTS TO PRE-SET CALIBRATIONS, PARTICULARLY IN SAFETY EQUIPMENT.*

III. MAINTENANCE:

A consistent conscientious maintenance program produces many benefits. Profit robbing down time due to breakdowns will be minimized and the passengers will experience the safest possible rides.

A. Lubrication:

A regular lubrication program will increase bearing life while protecting spindles and raceways which will eliminate costly repairs later. Refer to the lubrication chart (Fig. #5) and instructions below.

1. **Main Pivots:** Weekly

   There are two (2) grease fittings on the boom main boom pivot housing, one on either side of the boom. Lubricate these fittings liberally once each week with a medium consistency lubricant.

2. **Main Hub Assembly:** Weekly

   There are two (2) grease fittings in this assembly. One is located at the lower end of the hub just above the bottom plate for the lower bearing. The other is in the lower portion of the center ornament just above the hub for the upper bearing. Each of these should be lubricated liberally with a medium consistency lubricant weekly.

3. **Ram Bearings:** Weekly

   Each hydraulic ram requires grease at each bearing, one on each end of the rams. A grease fitting is provided in the forward piston rod eye (bearing housing) at the boom connection. The rear pivotal mountings are lubricated remotely through two (2) fittings, one on each outside upright part of the frame just above the ground. These four (4) fittings should be lubricated with a medium consistency lubricant weekly.

4. **Drive Assemblies:** Monthly

   Two (2) flange style bearings are included on the counter shaft of each drive assembly. Each bearing has a grease fitting and should be greased as required. These bearings are sealed bearings and *OVER-GREASING WILL DESTROY THE SEALS.* Wheel bearings are used on the drive tire wheels. These bearings should be repacked approximately every 1000 hours of operations.

5. **Automatic Door Assembly:**

   a. Lubricate all moving parts regularly.
   b. Lubricate the pivot linkage on the door movement arm.

B. General Service:

A regular preventative maintenance program carried out along with the lubrication program will save many dollars in lost revenue and repair expenses as well as minimize the chances for accidents.

1. **Drive:**

   Each drive assembly includes five (5) V-belts, two (2) on the primary side for motor drive and three (3) on the secondary side to power the drive tire. All belts are "B-Section" design. Belts should be kept tight to reduce slippage and wear. The belts should be checked often on a new ride or when new belts are installed as they do tend to "seat in". Do not overtighten the belts as this will cause excessive wear on bearings.

2. **Brakes:**

   A drum brake assembly is included on each drive. These are located in the wheel sheave (see drawing SR-123, Rev. A). All friction brakes experience wear and the brakes on the Super Round-Up should be carefully maintained. The highest quality material is used, but the brake shoes will have to be replaced with use. To inspect or service the brake shoes, remove the cap and spindle nut. Be careful that the washer and two part bearing do not fall out. Lower the wheel and hub assembly. The shoes can now be serviced much like an automobile drum brake. When reassembling, be sure to repack the bearings with a light bearing grease. *DO NO OVERTIGHTEN THE SPINDLE NUT.* To adjust the brakes, loosen the adjustment nut with a brake adjusting tool until the shoe engages the drum sufficiently to hold it. Next, tighten the nut three "clicks". Both brakes should be serviced at the same time.

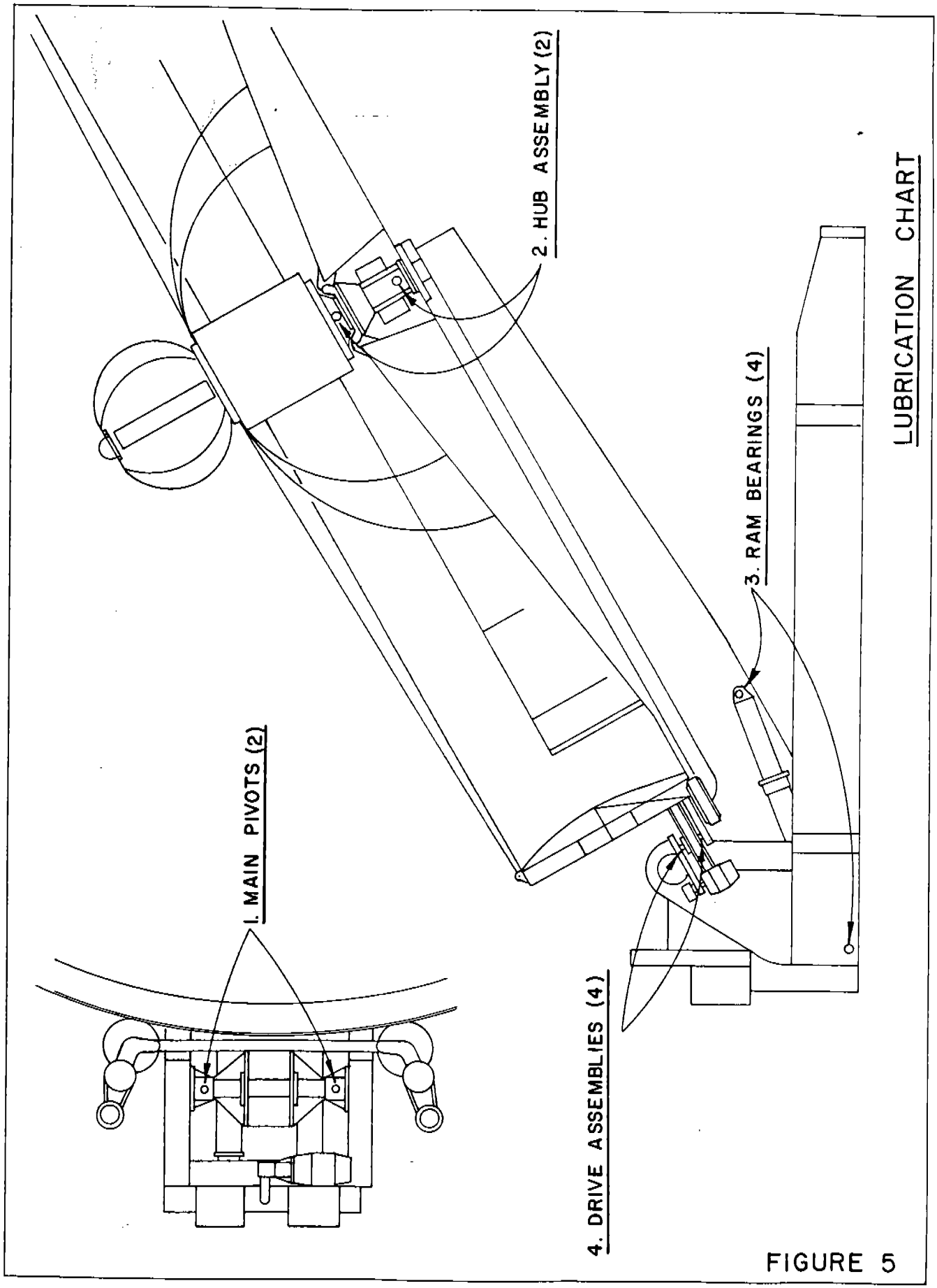

LUBRICATION CHART
1. MAIN PIVOTS (2)
2. HUB ASSEMBLY (2)
3. RAM BEARINGS (4)
4. DRIVE ASSEMBLIES (4)

FIGURE 5

3. Rams, Boom Elavators:

The "rams" are high pressure hydraulic cylinders and each uses a high pressure packing gland in the piston end of the cylinder wall to prevent leaking. If hydraulic fluid begins to leak around the ram, the packing should be replaced. It may be necessary to remove three passenger cars and corresponding walkway, panels, fence, tie.rods and two sweeps to gain access to the rams. With the boom in the lowered position remove the hydraulic hose and grease hose from the rear of the ram; next remove the large washer on the rod eye bearing end of the ram at the boom connection. Remove the pin from the rear clevis end of the ram. Raise the clevis end high enough to slide the ram assembly back away from the boom. Raise the ram out of the frame and place it in a clean location for repairs. Remove the packing gland bolts and the packing gland can be removed over the cylinder eye with ram (piston) still in place. The worn packing seal can now be removed and new seals installed around the ram. A simple tool can be made to assist in removing the worn seals by welding small wood or sheet metal screws to the ends of two short rods. Slide these along opposite sides of the ram between the cylinder wall, and screw the screws into the worn packing. The "removal tools" can be pulled back with the seal. Replace the seals only with factory recommended replacements. While repairing the rams be sure to inspect the packing gland seal and the bearings in either end of the ram assembly. Replace any worn parts. Re-install the ram assembly on the ride by first placing the rod eye bearing over the boom connection rod with the rear of the ram slightly elevated. Push the ram toward the boom until the rear bearing housing is in position over the frame connection. Lower ram in place and reinstall the pin, washer and grease hose.

4. Hub Assembly:

The hub assembly is the bearing housing for the main wheel assembly. These bearings are all grease packed at assembly at the factory. Keeping the bearings well lubricated will keep this assembly in working order. It is recommended that once a year the center ornament be removed and inspect the bearing lock nuts on the top of the center spindle. Due to bearing wear it is possible for these bearings to become loose. Operating the ride for long periods with bearings too loose can cause damage to the bearings and possibly to the spindle.

5. Hydraulic Circuit:

The hydraulic system is shipped completely assembled and is checked thoroughly prior to shipment. It is recommended that after the "break-in" period (approximately 500 to 1000 operating hours) the fluid be changed. The park model Super Round-Up uses approximately 65 gallons of Chevron No. 32 EP Hydraulic Fluid (55 gallons in the Portable Super Round-Up). The oil level in the tank should be within three inches (3 inches) of the top of the tank with the system charged and the boom down. An intake filter is installed on the intake pipe inside the tank. *KEEP THIS FILTER CLEAN.* Do *NOT* operate the ride without a filter. Use only factory recommended filters. A vacuum indicator is mounted on the elbow connection from tank to pump. If excessive vacuum is indicated, it is probably time to replace the filter.

6. Automatic Door Assembly:

a. SAFETY TAPE SWITCH: Depress occasionally to check for proper function.

b. SAFETY SLIP CLUTCH: In order to maintain the 40 pound pressure limit, check periodically with a spring scale. Refer to M-sheet for adjustment.

c. LIMIT SWITCHES ON THE DOOR: To determine whether the limit switches are controlling the door positions, check the door in the fully closed and open positions.

(1) Proper adjustment for closed position: The leading edge of the door is completely engaged with the stationary framework, and the safety tape switch is just contacting the angle iron stop.

(2) Proper adjustment for open position: The back edge of the door does not contact the stationary framework.

d. Check all electrical systems regularly for loose wires and broken connections.

7. Oil System

An oil temperature and sight gauge is mounted on the oil tank. The gauge records the temperature of the oil and the level of the oil in the tank. Add oil if the gauge indicator is below the red line. Refer to #5. Hydraulic Circuit for information on the proper oil level. Also use the temperature gauge to determine whether the system is running hot.

C. Trouble Shooting:

The following are some of the problems you may face and areas to check in locating and servicing problems.

1. When the Main Wheel Assembly will not rotate:

a) Check the electrical to determine if power is available at the ride. Check starter overloads (push reset button).

b) If the motors operate but the ride still has difficulty reaching proper main wheel rotation speed (16 RPM) the problem may be in the hydro-sheaves. The hydro-sheaves (mounted on the drive motor shafts) are included to reduce motor start-up loads and protect the drives. Severe slippage in the hydro-sheave indicates a low oil level. The hydro-sheave is filled with 63 ounces of FYRQUEL 550 (Stauffer Chemical). Do not overfill. Overfilling will cause the hydro-sheave to become "stiff" and overload the motor.

c) Check belt tension on the drives.

2. When the Main Wheel Assembly and Boom will not raise (or when the wheel and boom lower automatically without operator's signal):

a) Check the emergency dump valve. If it has been actuated, determine why the electrical elevation limit switch did not function. Do this before resetting the dump valve and operating the ride.

b) On rides equipped with the Speed Protection Sensor/Counter (Micro proximity switch and relay), check to determine the main wheel rotation speed. If the main wheel does not achieve 16 RPM the interlock will not allow the ride to operate.

c) Check the electrical solenoid interlock valve to determine that it is receiving an electrical signal at the proper time and that the coil is functional. If this valve does not function, the rams will not elevate the boom. If the valve does not receive a signal check the signal source. On rides equipped with an interlock timer, check the timer for proper operation. On rides equipped with an interlock Sensor/Counter, follow the check out procedures included in the manufacturers bulletin.

d) Check the main directional control valve. Determine if the coils (two) are functional. The valve can be operated manually by depressing the recessed plunger on the coil housing. Depressing one should raise the boom and the other will lower it. If you have determined that the electrical signal is reaching the coils and you can manually operate the valve but the console control will not operate the boom, then the coil is probably malfunctioning. This valve uses internal backpressure to shift the spool. A check valve with a minimum 65 psi setting is located next to the main valve to maintain this pressure. Various adjustments are incorporated in the main valve to assure a smooth operation. *DO NOT ATTEMPT TO MAKE ADJUSTMENTS TO THIS VALVE* without consulting the factory first.

e) If all the various components check O.K. and the boom can not be elevated, check the hydraulic pressure setting. A ¼" pipe size hole with plug is included in the pressure line to the rams for this purpose. This hole is located in the "tee" where the lines divide to the two rams. Remove the plug, with the pump off, and screw in a gauge. Use a 1500 psi guage. For best results use a glycerin or oil filled gauge. With the pump on the main valve energized for "UP", the gauge should read approximately 900 psi. For safety, it is recommended that a hose with appropriate fittings be used to read the gauge from outside the ride. The pressure is adjusted on the pressure relief valve located just above the pump. To make an adjustment, remove the hex cap and loosen the lock nut. Turning the adjustment screw clockwise will increase the pressure, counterclockwise will decrease the pressure.

3. Drive Slippage:

If "squealing" or slippage occurs during rotation start-up or braking, adjust the tire pressure to the outer rim by use of the turnbuckle provided.

4. Noisy Hydraulic Circuit:

If a squealing occurs in the hydraulic system, air is probably in the fluid. This is not uncommon if the hydraulic system has been worked on. This noise will generally disappear with operation in an hour. If the noise persists, change the intake filter in the tank and check the oil level. (See hydraulic system above.) If the noise still remains, there is probably a leak in the intake line. Tighten all fittings and check for leaks.

D. Automatic Door Assembly Trouble Shooting:

1. Always Check for Loose Wires and Broken Connections in the Event of Any Malfunction in the Electrical Operations.

Use wiring diagram #SR-504 to trace wiring.

2. One Door Will Not Operate. The Doors are Properly Aligned with the Entrance-Exit Ramps and the Drive Motor is Off.

a. Door will not open: Check the voltage between the black and white wires in the junction box on the door.

b. Door will not close: Check the voltage between the black and white wires in the junction box on the door.

c. If there is no voltage between the black and white wires, there may be a loose connection in the wiring that leads from the sweep to the door.

d. If there is voltage between the black and white wires, the problem may be in the limit switches on the door, the motor on the door or the capacitor in the junction box.

3. Both Doors Will Not Open. The Doors are Properly Aligned with the Entrance-Exit Ramps.

a. Check the breaker in the center hub marked "DOORS".

b. NOTE: Turn the control switch on the operator's console to "OPEN" in order to check the operation of the following functions.

c. Look for the problem in the limit switches on the center hub. Manually check one limit switch on the center hub at a time by flipping the switch lever. Either switch should cause the doors to open. In order for the doors to open, the solenoid actuator lever must contact one of the limit switches on the center hub. Check to see if the actuator is in the up position. Adjust the limit switch arm if it is not contacting the actuator in the up position.

d. Look for the problem in the relay box.

(1) Check for input power by checking the voltage at wire 1 Black (B).

(2) Check the voltage where wire 3 Black (B) connects to the terminal block in the relay box. If there is no voltage at connection 3 Black (B), with one of the center hub switches activated, the switch is malfunctioning, or it may have a poor connection. Check each switch.

(3) If there is voltage at connection 3 Black (B), check the voltage where wires 35 Black (B) and 32 Black (B) connect to upper relay. If there is voltage at these points, but no voltage where wires 24 Black (B) and 13 Black (B) connect to the same relay, the relay is defective.

4. Both Doors Will Not Close.

a. NOTE: Turn the control switch on the operator's console to "CLOSE" in order to check the operation of the following functions.

b. Look for the problem in the limit switches on the center hub. Make sure the actuator lever is in the down position. In order for the doors to close, the levers on the center hub limit switches must not contact the actuator lever. Adjust the switch levers if necessary.

c. Look for the problem in the relay box.
(1) Check for input power by checking voltage at wire 1 Black (B).

(2) Check the voltage where wire 6 Red (R) joins the terminal block in the relay box. If there is no voltage, the problem is in a limit switch on the center hub or in the connection to a limit switch.

(3) If there is voltage on 6 Red (R), check the voltage where 10 Red (R) and 21 Red (R) join the relay. If there is no voltage at these points, check the voltage between 7 Black (B) and 25 Blue at the same relay. If there is voltage between the 7 Black (B) and 25 Blue connections, the relay is malfunctioning.

(4) If there is no voltage at the 7 Black (B) and 25 Blue connections, the safety tape switch on one of the doors may be malfunctioning or the relay connected to wire 28 Black (B) may be stuck.

5. Doors Operate Irratically When Opening.

If the doors tend to bounce back and forth at the end of the travel when opening, check the relay

connected to wire 28 Black (B). Use an Ohm Meter to check for continuity at terminals #1 and #3. If there is continuity when the door is opening, the relay is working properly. The relay is malfunctioning if there is no continuity.