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NAME: RIVER RIDE
Type: Non-Kiddie

OPERATIONS AND MAINTENANCE MANUAL

HOLIDAY WORLD

SANTA CLAUS, INDIANA, U.S.A.

CARINYTOWN.COM

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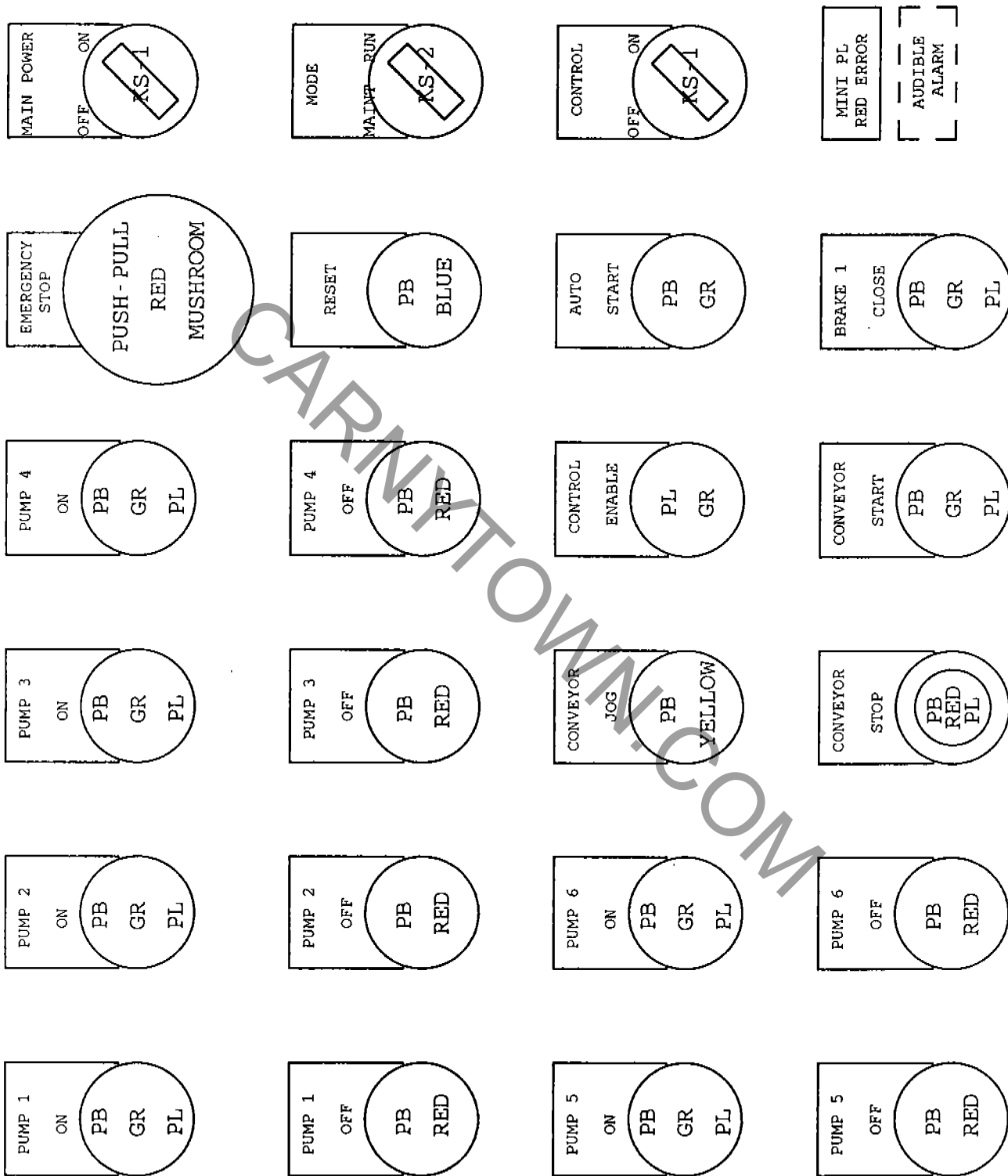
RIVER RIDE
OPERATIONS AND MAINTENANCE MANUAL

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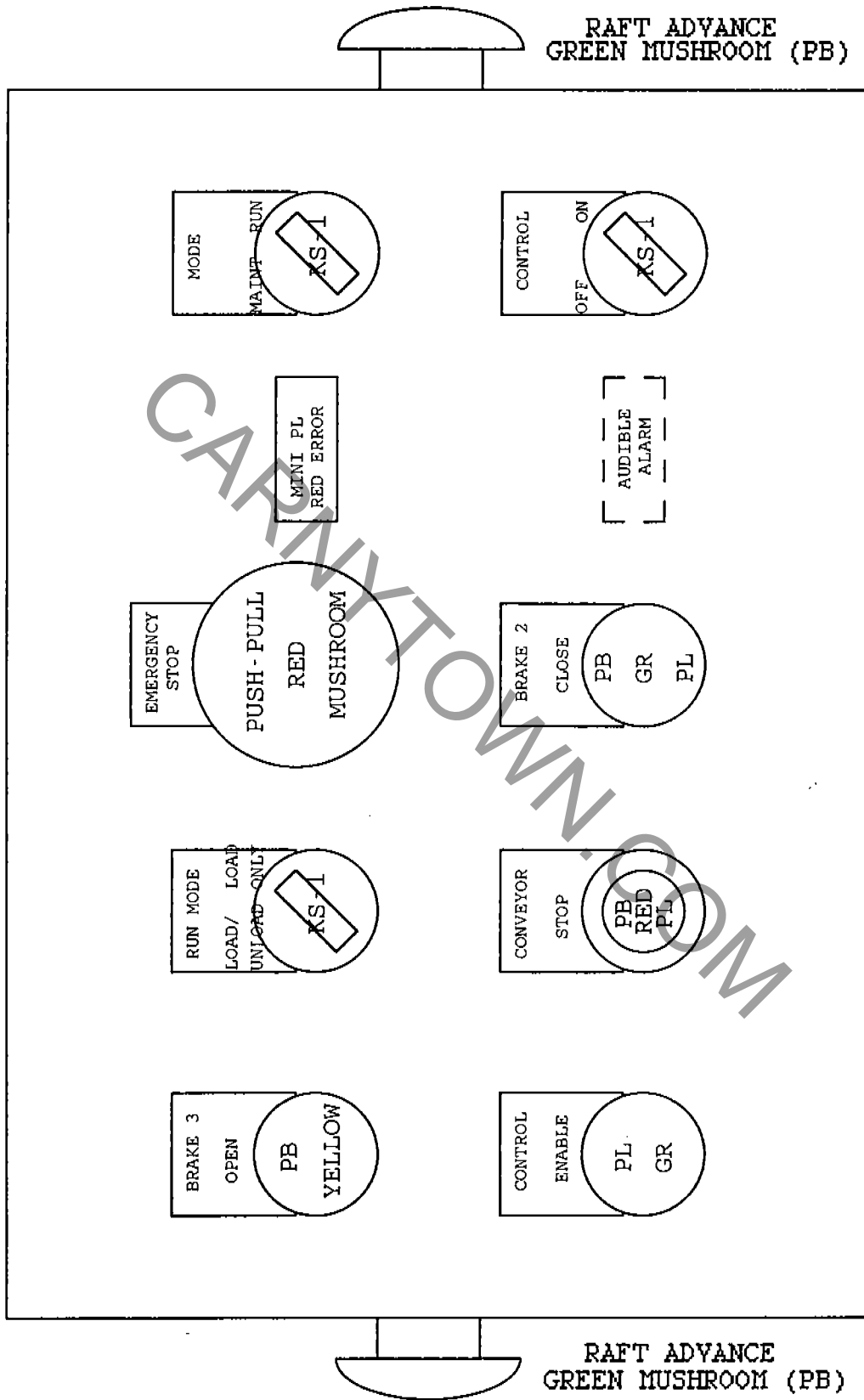
RAFT ADVANCE 2
GREEN MUSHROOM (PB)



RAFT ADVANCE 1
GREEN MUSHROOM (PB)

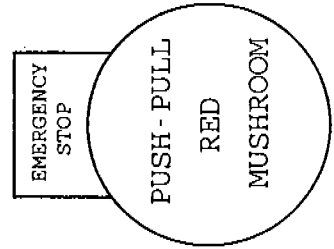
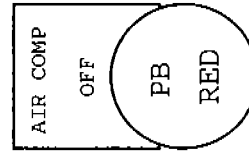
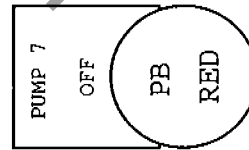
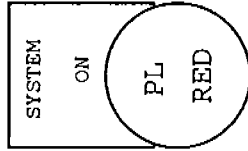
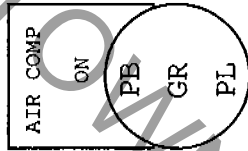
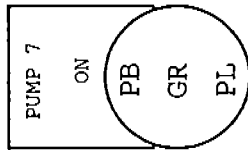


OPERATOR CONSOLE #1
A20009 - 40



OPERATOR CONSOLE #2
A20009-48

DL - 30 (DL)



BASIC DATA FOR RIVER RIDE

HOLIDAY WORLD
SANTA CLAUS, INDIANA, U.S.A

Designed and Manufactured by:

O. D. Hopkins Associates, Inc. of Contoocook, New Hampshire

Date of Start Up ----- March 1990
Total Ride Length ----- 1182 Feet
Total Ride Time ----- Approximately 240 Seconds
Ride Capacity ----- Approximately 960 Passengers/Hour
Raft Dispatch Interval ----- 30 Seconds
Number of Rafts ----- Nine (9)
Raft Capacity ----- 8 Passengers
Trough Width ----- Approximately 13'-0 Feet
Average Water Velocity In Trough:
 Fast Water ----- 11 Feet/Second
 Slow Water ----- 4 Feet/Second
Average Water Flow Rate ----- 90,000 Gallons/Minute
Conveyors & Brakes ----- 40 HP Electric Drive
Main Pumps ----- 4 @ 95 HP
Show Water Pumps ----- 2 @ 2 HP
Filter Pump ----- 1 @ 3 HP
Hoist ----- 1 @ 2 Ton, Electric

RIVER RAFT RIDE

SECTION 1

INTRODUCTION

1.0 GENERAL

The river raft ride consists of several rafts, three (3) brakes (B), and a lift and down conveyor (LC). The river raft ride is made up of several different areas. These areas are separated by brakes (B1), (B2), and (B3), conveyors, and photo eyes (PI1) through (PI4). The (PI)'s send signals to the programmable controller (PC) which along with the input from the operators at Operator Console 1 (OC1) and Operator Console 2 (OC2), controls the ride operation.

1.1 CONTROL SYSTEM

The control system is divided into four (4) separate operational modes:

- 1) Run Mode 1, Station 1 (S1) Only, Unload & Load
- 2) Run Mode 2, (S1) & (S2), (S1) Unload, (S2) Load
- 3) Run Mode 3, (S1) & (S2), (S1) Unload/Load, (S2) Unload/Load
- 4) Maintenance Mode

The River Ride is operated by trained personnel from two operator consoles located at the stations. The operators are assisted by built-in programming and other components that make up the ride control system. The main purpose of the ride control system is to safely dispatch rafts into and retrieve rafts from the river of flowing water. The control system also detects some mechanical malfunctions such as:

- * Problems with the main pumps.
- * The lift conveyor is not in the proper position for normal ride operations.

- * Pneumatic tension insufficient.
- * Etc. (see error messages)

Any one of these problems will either cause the power to the entire ride system to shut off or will cause the conveyor to stop. A more detailed description of this can be found in the Maintenance section of this manual.

1.2 GENERAL SAFETY PRECAUTIONS

The following safety precautions are not related to any specific procedures and therefore do not appear elsewhere in this manual. These are precautions that personnel must understand and apply during many phases of operation and maintenance of the ride. Safe maintenance practices by qualified personnel are imperative to the success of the ride and the well-being of the guests. Some general precautions to follow:

- * Statements within this manual preceded by a NOTE heading should be especially heeded.
- * Do not service or adjust equipment alone. Whenever a potential for accident or injury exists, never attempt maintenance or adjustment except in the presence of someone who is capable of rendering aid. This is particularly important when such work is being performed after hours or in an area remote from other personnel.
- * Be familiar with resuscitation techniques. Personnel working with or near high voltages should be familiar with the methods of cardiopulmonary resuscitation (CPR).
- * Know and comply with Federal OSHA requirements.

1.2.1 ELECTRICAL PRECAUTIONS

Before initiating maintenance procedures on any electrical or electronic equipment, make sure all

power sources are disconnected from the equipment and any of its accessories. Under certain conditions dangerous potentials exist even when the power is disconnected due to charges retained by capacitors. Always remove power and discharge a circuit to ground before touching it.

1.2.2 MECHANICAL PRECAUTIONS

Rotating parts of machinery can cause serious or fatal injury. When working around such machinery avoid contact with moving parts. Wear appropriate clothing (without loose sleeves) and use appropriate safety equipment as specified in the OSHA General Industry Standards. When attempting maintenance or repair to such machinery, disconnect all power sources and allow the unit to come to a complete stop before approaching it.

SECTION 2

CONTROL SYSTEM OPERATOR CONSOLE 1

A20009-40

2.0 GENERAL

This console "pedestal mount" consists of three (3) key switches (KS), twenty-one (21) push buttons (PB), one (1) mini pilot light (PL), one (1) regular (PL), and an audible alarm (AL).

2.1 (PB) - PUMP 1/ON

This (PB) with (PL) is used to start pump 1 in the maintenance mode. The (PL) will illuminate any time the pump is on.

2.2 (PB) - PUMP 2/ON

This (PB) with (PL) is used to start pump 2 in the maintenance mode. The (PL) will illuminate any time the pump is on.

2.3 (PB) - PUMP 3/ON

This (PB) with (PL) is used to start pump 3 in the maintenance mode. The (PL) will illuminate any time the pump is on.

2.4 (PB) - PUMP 4/ON

This (PB) with (PL) is used to start pump 4 in the maintenance mode. The (PL) will illuminate any time the pump is on.

2.5 (PB) EMERGENCY STOP

This push-pull mushroom (PB) is used to stop the entire ride. It must be pulled out to restart the ride. An error will appear on the data liner (DL).

All systems will stop except for the (PC), 24-VDC system, and (DL).

2.6 *(KS-1) MAIN POWER, OFF/ON

This (KS-1) is used to turn the main power on and off. (KS-1) is a different key than (KS-2).

2.7 (PB) PUMP 1/OFF

This (PB) is used to stop pump 1 in the maintenance mode.

2.8 (PB) PUMP 2/OFF

This (PB) is used to stop pump 2 in the maintenance mode.

2.9 (PB) PUMP 3/OFF

This (PB) is used to stop pump 3 in the maintenance mode.

2.10 (PB) PUMP 4/OFF

This (PB) is used to stop pump 4 in the maintenance mode.

2.11 (PB) RESET

This (PB) is used to reset all systems for start-up, and erase certain messages from the (DL), after the errors have been corrected.

2.12 (KS-2) MODE, MAINTENANCE/RUN

This (KS) is used to select the mode of operation of the ride. This (KS-2) has a different key than (KS-1).

2.13 (PB) PUMP 5/ON

This (PB) with (PL) is used to start pump 5 in the run or maintenance mode. The (PL) will illuminate when the pump is on.

2.14 (PB) PUMP 6/ON

This (PB) with (PL) is used to start pump 6 in the run or maintenance mode. The (PL) will illuminate when the pump is on.

2.15 (PB) CONVEYOR JOG

This (PB) is used to start the conveyor in the maintenance mode. The conveyor will only run while the (PB) is held down. The conveyor will stop when the (PB) is released.

2.16 (PL) CONTROL ENABLE

This (PL) will illuminate when the automatic start-up sequence is completed.

2.17 (PB) AUTO START

This (PB) is used to begin the automatic start-up sequence in the run mode.

2.18 *(KS-1) CONTROL, OFF/ON

This (KS-1) is used to turn the control system on, and operates the automatic shut down sequence after operating in the run mode.

*(KS-1) is a different key from (KS-2)

2.19 (PB) PUMP 5/OFF

This (PB) is used to stop pump 5 in the run or maintenance mode.

2.20 (PB) PUMP 6/OFF

This (PB) is used to stop pump 6 in the run or maintenance mode.

2.21 (PB) CONVEYOR STOP

This (PB) with (PL) is used to stop the conveyor in the run mode. The (PL) will illuminate when the conveyor is stopped. The (PB) has a raised nut.

2.22 (PB) CONVEYOR START

This (PB) with (PL) is used to start the conveyor in the run mode. The (PL) will illuminate when the conveyor is on.

2.23 (PB) BRAKE 1/CLOSE

This (PB) with (PL) is used to close the Brake 1 Upstream Arm (USA1) in the run or maintenance modes. The brake will only stay closed in the maintenance mode while the (PB) is held down. The (PL) will illuminate when the brake is closed.

2.24 (PL) ERROR

This mini red (PL) will illuminate to indicate an error in the system.

2.25 (AL) AUDIBLE ALARM

This (AL) will sound when a raft remains in front of (PI4) for more than 5 seconds. (AL) is located inside (OC1) and will sound for 5 seconds.

2.26 (PB) RAFT ADVANCE 1 & 2

These two (2) (PB) when pressed simultaneously will open brake 1 in the run or maintenance mode. The Brake 1 Downstream Arm (DSA1) will close, in the maintenance mode, when the (PB) are released.

SECTION 3

OPERATOR CONSOLE 2

A20009-48

3.0 GENERAL

This console "pedestal mount" consists of three (3) key switches (KS), six (6) push buttons (PB), one (1) mini pilot light (PL), one (1) regular (PL) and one (1) audible alarm (AL).

3.1 (PB) BRAKE 3/OPEN

This (PB) will open brake 3 in the maintenance mode. Brake 3 will only remain open while the (PB) is held down.

3.2 (PL) ERROR

This mini red (PL) will illuminate to indicate an error in the system.

3.3 (PB) EMERGENCY STOP

This push-pull mushroom (PB) is used to stop the entire ride. It must be pulled out to restart the ride. An error will appear on the (DL). All systems will stop except for the (PC), 24V system, and the (DL).

3.4 (KS-2) MODE, MAINTENANCE/RUN

This (KS-2) is used to select the mode of operation of the console. The (OC2) can only be operated in the maintenance mode if the Mode (KS) on (OC1) is also in the maintenance mode. The key for (KS-2) is different from the key for (KS-1).

- 3.5 (PL) CONTROL ENABLE
This (PL) will illuminate when the automatic start-up sequence is complete.
- 3.6 (PB) CONVEYOR/STOP
This (PB) with (PL) will stop the conveyor in the run mode. The (PL) will illuminate. This (PB) has a raised nut.
- 3.7 (PB) BRAKE 2/CLOSE
This (PB) with (PL) is used to close the Brake 2 Upstream Arm (USA2) in the run or maintenance mode. The (PL) will illuminate. The brake will only stay close in the maintenance mode while the (PB) is held down.
- 3.8 (KS-1) CONTROL, OFF/ON
This (KS-1) will turn off/on (OC2).
The (KS-1) is different from (KS-2).
- 3.9 (AL) AUDIBLE ALARM
This (AL) will sound when a raft remains in front of (PI4) for more than 5 seconds. This (AL) is located inside of (OC2), and will sound for 5 seconds.
- 3.10 (PB) RAFT ADVANCE 1 & 2
These two (2) (PB) when pressed simultaneously will open brake 2 in the run or maintenance mode. The Brake 2 Downstream Arm (DSA2) will close, in the maintenance mode, when the (PB) are released.
- 3.11 (KS-1) RUN MODE, LOAD-UNLOAD/LOAD ONLY
This (KS-1) is used to select the run mode desired. Either unload at Station 1 and load at Station 2, (OR) unload and load at both (S1) and (S2).

SECTION 4

MAIN CONTROL PANEL FRONT DOOR LAYOUT

A20009-50

- 4.1 (DL) DATA LINER
This (DL) is an electronic digital readout that displays the mode the ride is in, (OR) error messages, should one occur.
- 4.2 (PB) PUMP 7/ON *
This (PB) will start pump 7 (filter pump).
- 4.3 (PB) PUMP 7/OFF *
This (PB) will stop pump 7 (filter pump).
- 4.4 (PB) AIR COMPRESSOR/ON *
This (PB) will start the air compressor.
- 4.5 (PB) AIR COMPRESSOR/OFF *
This (PB) will stop the air compressor.
- * These four (4) (PB) are direct wired to the starters and are not wired to the (PC).
- 4.6 (PL) SYSTEM ON
This (PL) will illuminate when the ride system is on in the run or maintenance mode.
- 4.7 (PB) EMERGENCY STOP
This push-pull mushroom (PB) is used to stop the entire ride. It must be pulled out to restart the ride. An error will appear on the (DL). All systems will stop, except for the (PC), 24V system, and the

(DL). Pressing this (PB) will also stop pump 7 and the air compressor.

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SECTION 5

RIDE OPERATION - NORMAL

5.0 GENERAL

The ride is controlled from two (2) platforms at the stations. Operator Console 1 (OC1) is located at Station 1 (S1), Operator Console 2 (OC2) is located at Station 2 (S2).

Brakes 1 & 2, (B1) & (B2), have two (2) arms each. Brake 3 (B3) has one (1) arm. Each arm is activated by an air cylinder, controlled by a two position single acting control valve. These valves are spring loaded on one side and 24VDC solenoid activated in the other direction. On (B1) and (B2) the arms are retracted when the solenoids on each valve are not energized. The (B3) arm is closed when not energized. The brake arms for (B1) and (B2) are described as upstream and downstream arms (USA) and (DSA).

5.1 RUN MODE 1, STATION 1 (S1) ONLY. SEE (OC1) A20009-40

5.1.1 In this mode (mode 1), (B2) is not used. (OC2) is not turned on. The (B2) arms are full open.

5.1.2 The normal position of (DSA1) is closed. This is to catch the incoming raft. (USA1) is open to allow the raft to enter (S1).

5.1.3 (B3) is open. (B3) always operates independently of (B1) and (B2). When a raft passes (PI3) a 30 second timer will start. If another raft passes (PI3) before the 30 seconds elapse, (B3) will close and stop the raft. When the 30 seconds have elapsed, (B3) will open

and the timer will start again. When a raft passes (PI3) after the 30 seconds have elapsed, (B3) remains open, and the timer starts again. This sequence is repeated for as long as the ride operates in any of the run modes.

5.1.4 Automatic start-up of the ride.

- 1) The Mode (KS-2) should be in the Run position and the key should be removed.

NOTE:
THE MODE (KS) MUST BE IN THE DESIRED POSITION BEFORE TURNING ON THE MAIN POWER.

- 2) Turn the Main Power (KS) to the On position, the 24VDC system and the (DL) will be activated.
- 3) Turn the Control (KS) to the On position.
- 4) Press the Reset (PB).
- 5) Press the Auto Start (PB).
- 6) This will begin the automatic start-up cycle.
 - a) Pump 1 will start ----- 15 second delay
 - b) Pump 2 will start ----- 15 second delay
 - c) Pump 3 will start ----- 15 second delay
 - d) Pump 4 will start ----- 4 minute delay
 - e) Pump 5 will start ----- 15 second delay
 - f) Pump 6 will start ----- 5 second delay
 - g) (DSA1) will close ----- 5 second delay
 - h) Control Enable (PL) will illuminate

- 5.1.5 If all is well and there are no errors, the operator may press (PB) Conveyor Start. The conveyor will start and the (PL) will illuminate.

- 5.1.6 Rafts will travel up the conveyor and on to Station 1 (S1). When the raft hits (DSA1), the operator will press the Close Brake (PB) and (USA1) will close.
- 5.1.7 After passengers are loaded into the raft, the operator will press both Raft Advance (PB) simultaneously. The (B1), (DSA1) and (USA1) will open.
- 5.1.8 When the raft clears (PI1), the (DSA1) will close.
- 5.1.9 The next raft will come into (B1) and the process will be repeated.
- 5.1.10 If a raft remains in front of (PI4) for more than 5 seconds, the (AL) will sound for 5 seconds. The operator should stop the conveyor by pressing the (PB) Conveyor Stop.
- 5.1.11 The operator should restart the conveyor when the raft pile-up is cleared from the station by pressing the Conveyor Start (PB).
- 5.1.12 Note: The show water pumps (P5) and (P6) may be stopped and started as desired during ride operation.
- 5.1.13 The entire ride, except for the (DL), (PC), and 24V system, may be stopped by pressing the Emergency Stop (PB). To restart the ride, pull the Emergency Stop (PB) out, and press the Reset and the Auto Start (PB).

NOTE:
**THE EMERGENCY STOP (PB) SHOULD ONLY
BE USED IN AN EMERGENCY SITUATION.
RAFTS CAN BE CAUGHT ON THE BOTTOM OF**

**THE RIDE AND DAMAGE MAY OCCUR.
PASSENGERS SHOULD BE REMOVED FROM
ALL RAFTS BEFORE THE RIDE IS
RESTARTED.**

5.2 RIDE SHUT DOWN

No rafts should ever be left on the conveyor or in a dry area of the river when the ride is not operating.

5.2.1 After all passengers are cleared from the ride and there are no rafts on the conveyor, the operator should stop the conveyor.

5.2.2 Allow enough time for all rafts to travel around the ride and pile up against the base of the stopped conveyor.

5.2.3 The ride is now ready to be shut down. Turn the (KS) Control to the Off position and remove the key. This will begin the auto shut down sequence.

- 1) Control Enable (PL) will go out
- 2) (DSA1) will open and (B3) will close
- 3) (P6), (P5), (P4) will stop ---- 5 second delay
- 4) (P3) will stop 5 second delay
- 5) (P2) will stop 5 second delay
- 6) (P1) will stop 5 second delay

5.2.4 The operator will turn the Main Power (KS) to the Off position and remove the key.

5.3 RUN MODE 2, (S1) UNLOAD, (S2) LOAD

SEE (OC1) A20009-40 & (OC2) A20009-48

(B1) and (B2) work together each with their own operator (O1) and (O2). There is enough space between

(S1) and (S2) to hold one (1) raft. There is enough space between (S2) and (B3) to hold two (2) rafts.

Rafts will be unloaded at (S1) and loaded at (S2). When the raft at (S1) is unloaded Operator 1 (O1) will advance the raft. If the raft at (S2) is not released, the raft just released from (S1) will be held between (S1) and (S2). Another raft may enter (S1) for unloading.

5.3.1 The normal position of (DSA2) is closed to catch the raft released from (S1). The normal position of (DSA1) is closed to catch the raft from the conveyor.

5.3.2 Automatic Start-Up

- 1) The Mode (KS) should be in the Run position
- 2) On (OC2) the (KS) Run Mode should be in the Load Only position; (KS) Mode should be in the Run position; and Control (KS) should be in the On position. [If these (KS) are not properly positioned, the correct mode of operation will not be achieved]
- 3) On (OC1) turn the Main Power (KS) to the On position.
- 4) Turn the Control (KS) to the On position.
- 5) Press the Reset (PB).
- 6) Press the Auto Start (PB).
- 7) This will begin the auto start-up sequence.
 - a) Pump 1 will start ----- 15 second delay
 - b) Pump 2 will start ----- 15 second delay
 - c) Pump 3 will start ----- 15 second delay
 - d) Pump 4 will start ----- 4 minute delay
 - e) Pump 5 will start ----- 15 second delay
 - f) Pump 6 will start ----- 5 second delay
 - g) (DSA1) & (DSA2) will close - 5 second delay
 - h) Control Enable (PL) will illuminate on (OC1) & (OC2)

- 5.3.3 If all is well and there are no errors, the (O1) at (OC1) may press (PB) Conveyor Start. The conveyor will start and the (PL) will illuminate.
- 5.3.4 Rafts will travel up the conveyor and on to the (S1) where the raft will be caught at (B1). The (O1) will press both Raft Advance (PB) simultaneously and allow the raft to travel to (B2). This procedure will be repeated until all rafts are loaded.
[Note: Each time a raft clears (PI1), the (DSA1) will close]
- 5.3.5 At (S2) the (O2) at (OC2) will press (PB) Brake Close. After loading the raft, the (O2) will press both (PB) Raft Advance simultaneously. The raft will go downstream. When the raft clears (PI2), the (DSA2) will close. The next raft will enter (B2) and the process will be repeated.
- 5.3.6 When loaded rafts reach (S1) the (O1) at (OC1) will press the (PB) Brake Close. The (B1) (USA1) will close. After the passengers are unloaded the (O1) will press both (PB) Raft Advance simultaneously and (B1) will open. The (DSA1) will close after the raft clears (PI1).
- 5.3.7 When a raft remains in front of (PI4) for more than 5 seconds, the (AL) will sound on (OC1) and (OC2). Either (O1) or (O2) may stop the conveyor.
- 5.3.8 The (O1) at (OC1) may restart the conveyor when the pile-up is clear.
- 5.3.9 The (P5) and (P6) may be stopped and started as desired during ride operation.

5.3.10 The entire ride, except the (DL), (PC), and 24V system, may be stopped by pressing the Emergency Stop (PB). To restart the ride, pull the (PB) out, and press the Reset (PB) and the Auto Start (PB).

NOTE:

THE EMERGENCY STOP (PB) SHOULD ONLY BE USED IN AN EMERGENCY SITUATION. RAFTS CAN BE CAUGHT ON THE BOTTOM OF THE RIDE AND DAMAGE MAY OCCUR. PASSENGERS SHOULD BE REMOVED FROM ALL RAFTS BEFORE THE RIDE IS RESTARTED.

5.4 RIDE SHUT DOWN

No rafts should ever be left on the conveyor or in a dry area of the river when the ride is not operating.

- 5.4.1 After all passengers are cleared from the ride, and there are no rafts on the conveyor, the (O1) or (O2) should stop the conveyor.
- 5.4.2 Allow enough time for all rafts to travel around the ride and pile up against the base of the stopped conveyor.
- 5.4.3 The ride is now ready to be shut down. On (OC1) turn the (KS) Control to the Off position and remove the key. This will begin the automatic shut down sequence. The (KS) Control on the (OC2) may be turned to the Off position and the key removed.
- 1) Control Enable (PL) will go out
 - 2) (DSA1) & (DSA2) will open, and (B3) will close
 - 3) (P6), (P5), and (P4) will stop - 5 second delay

- 4) (P3) will stop ----- 5 second delay
- 5) (P2) will stop ----- 5 second delay
- 6) (P1) will stop

5.4.4 The (O1) will turn the Main Power (KS) to the Off position and remove the key.

5.5 RUN MODE 3, (S1) UNLOAD/LOAD, AND (S2) UNLOAD/LOAD
SEE (OC1) A20009-40, (OC2) A20009-48

(B1) & (B2) operate separately, each with their own operator (O1) & (O2). The operation is similar to Run Mode 2, except both stations (S1) & (S2) will unload and load passengers.

5.5.1 The normal position of (DSA2) & (DSA1) is closed. Each brake (B1) & (B2) will stop every second raft.

5.5.2 Automatic Start-Up (OC1)

- 1) The Mode (KS) should be in the Run position.
- 2) On (OC2) the (KS) Run Mode should be in the Load/Unload position, and the Control (KS) should be in the On position.
- 3) (OC1) turn the Main Power (KS) to the On position and remove the key.
- 4) Turn the Control (KS) to the On position.
- 5) Press the Reset (PB).
- 6) Press the Auto Start (PB).
- 7) This will begin the Automatic Start-Up Sequence
 - a) Pump 1 will start ----- 15 second delay
 - b) Pump 2 will start ----- 15 second delay
 - c) Pump 3 will start ----- 15 second delay
 - d) Pump 4 will start ----- 4 minute delay
 - e) Pump 5 will start ----- 15 second delay
 - f) Pump 6 will start ----- 5 second delay
 - g) (DSA2) will close
 - h) The (PL) Control Enable will illuminate on (OC1) & (OC2)

5.5.3 If all is well and there are no errors, the (O1) at (OC1) may press the (PB) Conveyor Start. The conveyor will start and the (PL) will illuminate.

5.5.4 Rafts will travel up the conveyor and on to the stations. Because (B1) and (B2) are stopping every second raft, (DSA2) is closed, but (DSA1) is open. [Should (DSA1) be closed, simply press both Raft Advance (PB) and let the raft through (B1)]

The first raft will go through (S1) past (PI1), and stop in (B2). The (DSA1) will close and the second raft will stop in (B1).

5.5.5 Both (O1) and (O2) will press Brake Close (PB). After both rafts are loaded, the (O1) and (O2) will press both (PB) Raft Advance. (B1) and (B2) will open and both rafts will advance downstream.

5.5.6 (B3) will separate the second raft from the first raft by 30 seconds as previously described in 5.1.3.

5.5.7 As the second raft passes (PI2) the (DSA2) will close.

5.5.8 As the third raft passes (PI1) the (DSA1) will close. The third raft will stop at (B2), the (O2) will close (B2) and begin to unload/load the raft.

5.5.9 As the fourth raft enters (S1) it will be stopped by (B1). After (O1) closes (B1) they will begin to unload/load the raft.

5.5.10 After the passengers are loaded in the third raft the (O2) will press both Raft Release (PB) and release the raft. The (DSA2) will remain open.

- 5.5.11 After the passengers in the fourth raft are loaded, the (O1) will press both (PB) Raft Advance. The raft will travel downstream past (PI1), the (DSA1) will remain open. The raft will go past (PI2) and the (DSA2) will close.
- 5.5.12 The third and fourth rafts will be spaced by 30 seconds at (B3).
- 5.5.13 Should the fourth raft be loaded at (S1) before the third raft is loaded at (S2), the (O1) should not release the fourth raft. This would allow a fifth raft to enter (S1) and the (O1) should not stop this fifth raft. He should wait until the raft at (S2) is loaded and then release the fourth raft only when (O2) releases the third raft.
- 5.5.14 Now a fifth raft will pass (PI1) and (DSA1) will close. The fifth raft will stop at (B2). The sixth raft will stop at (B1). The cycle will repeat over and over.
- 5.5.15 When a raft remains in front of (PI4) for more than 5 seconds the (AL) will sound on (OC1) and (OC2), either (O1) or (O2) may stop the conveyor.
- 5.5.16 The (O1) at (OC1) may restart the conveyor when the station is clear.
- 5.5.17 The (P5) and (P6) may be stopped and started as desired during ride operation.
- 5.5.18 The entire ride, except for (DL), (PC), and 24V system, may be stopped by pressing the Emergency Stop (PB). To restart the ride, pull the (PB) out, and press the Reset and Auto Start (PB).

NOTE:

THE EMERGENCY STOP (PB) SHOULD ONLY BE USED IN AN EMERGENCY SITUATION. RAFTS CAN BE CAUGHT ON THE BOTTOM OF THE RIDE AND DAMAGE MAY OCCUR. PASSENGERS SHOULD BE REMOVED FROM ALL RAFTS BEFORE THE RIDE IS RESTARTED.

5.6 RIDE SHUT DOWN

No rafts should ever be left on the conveyor or in a dry area of the river when the ride is not operating.

5.6.1 After all passengers are cleared from the ride and there are no rafts on the conveyor, the (O1) or (O2) should stop the conveyor.

5.6.2 Allow enough time for all rafts to travel around the ride and pile up against the base of the stopped conveyor.

5.6.3 The ride is now ready to be shut down. On (OC1) turn the (KS) Control to the Off position and remove the key. This will begin the automatic shut down sequence. The (KS) Control on the (OC2) may be turned to the Off position and the key removed.

- 1) Control Enable (PL) will go out on (OC1) & (OC2)
- 2) (DSA2) will open and (B3) will close.
- 3) (P6), (P5), & (P4) will stop --- 5 second delay
- 4) (P3) will stop ----- 5 second delay
- 5) (P2) will stop ----- 5 second delay
- 6) (P1) will stop

5.6.4 The (O1) will turn the Main Power (KS) to the Off position and remove the key.

5.7 MAINTENANCE MODE/START UP

All systems may be tested in the maintenance mode.

NOTE:

THE TIMERS AND (PI) DO NOT CONTROL THE RIDE IN THE MAINTENANCE MODE, EXTREME CAUTION SHOULD BE TAKEN. THE RIDE SHOULD ONLY BE OPERATED BY QUALIFIED AND WELL TRAINED MAINTENANCE PERSONNEL. THE RIDE SHOULD NEVER BE OPERATED IN THE MAINTENANCE MODE WITH PASSENGERS.

- 5.7.1 On (OC2) turn the Mode (KS-2) to the Maintenance position. [Note: Only qualified maintenance personnel should possess the key for (KS-2)] Turn the Control (KS-1) to the On position. It will not make any difference whether the (KS-1) is in the load only or unload/load position.
- 5.7.2 On the (OC1) turn the Mode (KS-2) to the Maintenance position. [Note: Only qualified maintenance personnel should possess the key for (KS-2)] Turn the Main Power (KS-1) On. Turn the Control (KS-1) on. Press the Reset (PB).
- 5.7.3 All systems are activated. The (DL) may be checked for errors as listed in Section 8 of this instruction.
- 5.7.4 Operator Console 2 (OC2)
- 1) (B3) may be checked by pressing the (PB) Brake 3/Open. The brake will remain open while the (PB) is held down. The (B3) will close when the button is released.

- 2) The (DSA2) will be closed, the (USA2) will be open. The (USA2) may be tested by pressing the Brake Close (PB). The (USA2) will close and remain closed only while the (PB) is held down. The (USA2) will open when the (PB) is released. The (DSA2) may be tested by pressing both Raft Advance (PB) simultaneously. The (DSA2) will open. The (DSA2) will close when the (PB)'s are released.
- 3) The emergency stop may be tested by pressing the (PB). The (PB) must be pulled out to restart the ride.

5.7.5 Operator Console 1 (OC1)

- 1) (P1), (P2), (P3) and (P4) may be started and stopped as required.
- 2) (P5) and (P6) may be started and stopped as required. Take precautions, as these pumps may take water from the river. If (P1) through (P4) are not on, the river may be dry in that area and damage may occur to these pumps.
- 3) The Emergency Stop (PB) may be tested. It must be pulled out to restart the ride.
- 4) The conveyor may be tested by pressing the Conveyor Jog (PB). The conveyor will run as long as the (PB) is held down. The conveyor will stop if the (PB) is released.
- 5) The (DSA1) will be closed, the (USA1) will be open. The (USA1) may be tested by pressing the Brake Close (PB). The (USA1) will close and remain closed only while the (PB) is held down. The (USA1) will open when the (PB) is released. The (DSA1) may be tested by pressing both Raft Advance (PB) simultaneously. The (DSA1) will open. The (DSA1) will close when the (PB)'s are released.

5.7.6 Main Control Panel (See A20009-50)

- 1) The (DL) may be checked for messages.
- 2) The (PL) System On should be illuminated.
- 3) The Emergency Stop (PB) may be tested by pressing it. Not only will it stop the ride components, but this Emergency Stop (PB) will also stop the (P7) and the air compressor.

5.8 MAINTENANCE MODE/SHUT DOWN

5.8.1 Operator Console 2 (OC2)

- 1) Turn the (KS) Control to the Off position and remove the key.
- 2) Turn the (KS) Mode to the Run position and remove the key.

5.8.2 Operator Console 1 (OC1)

- 1) Be sure all rafts are backed up against the stopped conveyor.
- 2) Stop all pumps, the conveyor, etc.
- 3) Turn the (KS) Control to the Off position and remove the key.
- 4) Turn the Main Power (KS) to the Off position and remove the key.
- 5) Turn the Mode (KS) to the Run position and remove the key.

SECTION 6

MECHANICAL EQUIPMENT

6.0 The following is a description of the major mechanical systems and components associated with the River Ride installed at Holiday World in Santa Claus, Indiana. Specific information about these systems and components, as well as detailed information regarding bearings, bushings, chains, sprockets, etc. may be found on the referenced drawings.
(See Section 8 for more drawing listings)

6.1 LIFT CONVEYOR

Reference: Drawing #20001-90A Lift Conveyor Assembly

6.2 DOWN CONVEYOR

Reference: Drawing #20001-91A Down Conveyor Assembly

6.3 BRAKES (1) & (2)

Reference: Drawing #20005-13A Brake Assembly

6.4 BRAKE (3)

Reference: Drawing #20005-16A Brake Assembly

6.5 PUMPS

Reference: Drawing #20004-24A Pump Assembly

6.6 RAFTS

Reference: Drawing #20008-25A Raft Assembly

SECTION 7

MAINTENANCE RECOMMENDATIONS

7.0 ROUTINE MAINTENANCE PROCEDURES

The key to a successful maintenance program is to perform routine inspections and periodic preventative maintenance. The following maintenance recommendations apply to the major components of the ride and describe daily, weekly, monthly and seasonal procedures. Additional recommendations can be found in Section 8 - Technical Information for Purchased Parts.

7.1 DAILY (BEFORE RIDE START UP)

Put the Mode (KS) in the Maintenance position. Put the Power (KS) in the On position. Put the Control Panel (KS) in the On position.

7.1.1 Lift Conveyor

- 1) Check that the lift conveyor frame is in its full down position and that the limit switch is closed.
- 2) Check that (PI4) is secure and properly aligned.
- 3) Check for any air leaks and tighten.
- 4) While the lift conveyor is running, the conveyor belt roller support bearings are lubricated by water. On the upper end of the lift conveyor assembly there is sometimes not enough water running off the belt to lubricate these bearings. Each bearing should be lubricated.
- 5) Stop the conveyor. Each bearing should be lubricated by placing a small amount of grease on the top of the shaft, directly over the bearing.

7.1.2 Load & Unload Station

- 1) Check that (PI1), (PI2) and (PI3) are secure and properly aligned.

- 2) Check for any air leaks and tighten.
- 3) The brake arms are mounted on bearings, and are operated by air cylinders. Check that all bolts, pins, and brackets are properly aligned and tight.

7.1.3 Geysers Assemblies

- 1) Check that all hoses and fittings are secure and there are no air leaks.
- 2) Check that all photo eyes are secure, properly aligned, and that there are no obstructions between the pairs of photo eyes.

7.1.4 Ride Overall

Walk around the ride and check that all weirs and wavemakers are securely in place. Check for trash in the trough and the in the show water suction screens. Clean out traps in the trash screens on the show water pumps. Replace screen basket and secure cover.

7.1.5 Trash Screens

Remove all debris either floating or settled on the bottom from the reservoir and pump sump area. Remove all foreign matter and debris caught in the Main Water Pump trash screens. Check for and clean out debris in the water filtration suction screen.

7.1.6 Main Control Panel

- 1) Water Filtration System
For backwash procedures, see the enclosed brochure on "Vari-Flo" multi-port valves.
- 2) Air Compressor
Check that the intake filter is clean and the oil level is full. (See manufacturing brochure for regular maintenance)

7.1.7 Rafts

- 1) Check air pressure in each flotation ring. The pressure should be 1.5 psi. Do not add all air into one compartment; add a little air at a time to each compartment.
- 2) Check the drains. They should be clear of any foreign matter.
- 3) Check the seat belts. They should be securely fastened and the velcro should be clean and in good working order.

7.2 WEEKLY

- 1) Bearings - Grease all pillow block bearings.
- 2) Conveyor Belts - Check alignment and tension.
- 3) Geysers - Close off air supply valve on compressor air receiver discharge line. Bleed air from air line to geysers. Remove the pipe plug on top of each air directional control valve and insert approximately one teaspoon of hydraulic oil. Reinstall pipe plug and reopen air supply valve on compressor air receiver. Drain water condensation from each air receiver at each geyser by opening petcock valve on bottom of receivers. Close petcock valve after draining is completed.

7.3 MONTHLY

Same as Weekly

7.4 RAFT TUBE REPAIR - Instructions for Adhesive

- 1) Clean and buff all surfaces to be glued.
- 2) Apply thin coat of adhesive to each side and let dry. (15 minutes to 1 hour)
 - a) glue may be cut with toluene or zylene,
 - b) hardener ratio is 4 ounces to 1 gallon,
 - c) keep glue in a sealed container; discard glue if it is more than 12 hours old.

- 3) Apply second coat to each side and let dry. (5 to 15 minutes)
- 4) Apply third coat and let dry 5 minutes.
- 5) Apply pieces to be glued. (Solvent or heat may be used to activate if needed)
- 6) Roll patch from center outward.
- 7) Patch reaches maximum strength in 24 hours. It is best to avoid high pressure and the sun's heat buildup.

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SECTION 8

ERROR & MODE MESSAGES

- 8.0 The messages are listed in the order of decreasing priority.
- 8.1 Pump 1 - Thermal Overload
- 8.2 Pump 2 - Thermal Overload
- 8.3 Pump 3 - Thermal Overload
- 8.4 Pump 4 - Thermal Overload
- 8.5 Pump 1 - High Winding Temperature
- 8.6 Pump 2 - High Winding Temperature
- 8.7 Pump 3 - High Winding Temperature
- 8.8 Pump 4 - High Winding Temperature
- 8.9 Pump 1 - High Bearing Temperature
- 8.10 Pump 2 - High Bearing Temperature
- 8.11 Pump 3 - High Bearing Temperature
- 8.12 Pump 4 - High Bearing Temperature
- 8.13 Pump 1 - Water Influx
- 8.14 Pump 2 - Water Influx

- 8.15 Pump 3 - Water Influx
- 8.16 Pump 4 - Water Influx
- 8.17 Motor 8 - Conveyor Drive - Thermal Overload
- 8.18 Photo Eye 1 - Failure
- 8.19 Photo Eye 2 - Failure
- 8.20 Photo Eye 3 - Failure
- 8.21 Photo Eye 4 - Failure
- 8.22 Pressure Switch 1 - Brake System - Low Pressure
- 8.23 Pressure Switch 2 - Brake System - Low Pressure
- 8.24 Limit Switch 1 - Conveyor Base - Open
- 8.25 Emergency Stop Activated on Operator Console 1
- 8.26 Emergency Stop Activated on Operator Console 2
- 8.27 Emergency Stop Activated on Main Control Panel
- 8.28 Mode Switch in Maintenance Mode on Operator Console 1
- 8.29 Mode Switch in Maintenance Mode on Operator Console 2
- 8.30 Run Mode 1
- 8.31 Run Mode 2

8.32 Run Mode 3

8.33 Maintenance Mode

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SECTION 9

DRAWING LIST

<u>DRAWING #</u>	<u>DRAWING TITLE</u>
19004-01	GENERAL ASSEMBLY
19004-02	CENTERLINE LAYOUT
19004-03	CONCRETE LAYOUT
19004-04	UTILITIES LAYOUT
20001-90	LIFT CONEYOR ASSEMBLY
14001-82	Return Roller Assembly
14001-83	Conveyor Splice Assembly
14001-127	Bend Pulley Assembly
14001-128	Tension Pulley Assembly
14001-456	Tail Pulley Assembly
14001-608	Roller Frame Assembly
20001-91	DOWN RAMP CONVEYOR ASSEMBLY
20001-18	Tail Pulley Assembly
20001-50	Conveyor Roller Assembly
20001-129	Head Pulley Assembly
20001-120	WALKWAY ASSEMBLY
20003-19	HOIST AND FRAME ASSEMBLY
20003-20	HOIST AND FRAME ASSEMBLY
20003-23	CLEARANCE ENVELOPE
20004-10	SHOW WATER ASSEMBLY
20004-24	MAIN PUMP ASSEMBLY
20004-25	GEYSER ASSEMBLY
20005-13	BRAKE ASSEMBLY
20005-16	SINGLE ARM ASSEMBLY
20006-62A	RAFT GUIDE & WEIR ASSEMBLY
20006-69A	SAFETY GUARD & TRASH SCREEN ASSEMBLY

20008-25
20008-36

EIGHT (8) PASSENGER RAFT ASSEMBLY
Raft Bottom Assembly

20009-37

ELECTRICAL ASSEMBLY

20010-01

FILTER SYSTEM ASSEMBLY

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SECTION 10

SPARE PARTS

PART NO.	DESCRIPTION
20001-116a	BELT #220 2 PLY DIAMOND TOP 1/32" BACKING 30" WIDE x 155'
20001-116b	BELT SPLICE FLEXCO #125 SJ 30
20001-116c	NOPAK AIR CYLINDER, MODEL E, 250 PSI, 6" 0 BORE x 24" STROKE 1 1/4" Ø ROD S.S., CLASS 2 (B-1) THD. 1 1/4-12 THD.
20001-90d	NOPAK MOUNTING BRACKET #1797cy
20001-90e	NOPAK CLEVICE #4333cy
20001-90j	COUPLING #70 1" Ø HOLLAENDER
20001-90l	PINS #3253-cy-5 NOPAK
14012-03A	DODGE, CROWN PULLEY 12" O.D. x 32" HUB #F-25
14012-03b	DODGE, TAPERLOCK BUSHING #2517, 1 15/16" Ø BORE
14012-03c	PILLOW BLOCK (TYPE "K" EXP.) x 1 15/16" Ø BORE (DODGE)
14012-03d	PILLOW BLOCK (TYPE "E" NON-EXP) x 1 15/16" Ø BORE (DODGE)

20001-128b T.L. BUSHING, #2517, 2 7/16" Ø BORE
(DODGE)

20001-128c CYLINDER AIR, NOPAK, CLASS P6 STYLE
"E" 2 1/2" Ø BORE x 24" EFF. STROKE
1 3/8" ROD W/1-14 THD.

20001-128d TAKE-UP BEARING DODGE TYPE SCM 1
15/16" Ø BORE

20001-128aa ROLL PIN 7/16" Ø x 1 3/4

14001-456a TAKE-UP BLOCK, REXNORD MT8-2207,
2 7/16" Ø BORE

14001-456b DODGE, CONVEYOR PULLEY 14" Ø x 32"
CROWNED, Q.D. "E" HUB

14001-456c Q.D. BUSHING "E" 2 7/16" Ø BORE

14001-456d 2 PC. SHAFT COLLAR S.S. 2 15/16" Ø x
3/4" WIDE

14001-456pa ROLL PIN 1/4" Ø 2" S.S.

14001-456e 11 OZ. TUBE SEALANT, GEOCEL CLEAR

20001-82b PILLOW BLOCK BEARING, #SC123806,
DODGE

20001-82a PILLOW BLOCK BEARING, #SC123803,
DODGE

20001-98a EURODRIVE GEARMOUNT 40 HP KA 126, DT
200 L4 POS. B3 CONDUIT BOX @ 0°

3 15/16" Ø BORE 40HP 460V 3" Ø,
EXTERNAL BRAKE 460V, 3" Ø

20001-95b PILLOW BLOCK, REXNORD MA-2315-F

20001-95c PILLOW BLOCK, REXNORD MAS-2315-F

20001-95d PILLOW BLOCK, REXNORD MA-2307-F

20001-95e PILLOW BLOCK, REXNORD MAS-2307-F

20001-95f PULLEY 24" Ø x 32" LG. W/MS-HUB 3/8"
HERRINGBONE LAGGING DODGE

20001-95g Q.D. BUSHING "MS" 3 15/16" Ø BORE
W/KEYWAY 1" x 1/2" DODGE

20001-95h PULLEY 24" x 32" LG. W/F-HUB 3/8"
HERRINGBONE LAGGING DODGE

20001-95j Q.D. BUSHING "F" 3 7/16" Ø BORE
W/KEYWAY 7/8" x 3/16" DODGE

20001-95k SPROCKET DODGE #TLB1028 TYPE "B" 28
TEETH, FOR 3020 BUSHING

20001-95m TAPER LOCK BUSHING #3020 3" Ø BORE W/
3/4" KEYWAY

20001-95n U-JOINT SPLICER HEAVY DUTY SERIES
1810 ASS'Y #908191-1 W/BOLT 7/16"-20
x 1 3/4" LG. #7-73-228, NUT #231421-
4, WASHER #500357-12 QTY 24

20001-129a CONVEYOR BELTING, 220#, 2 PLY
POLYESTER DIAMOND TOP, 1/32 RUBBER
BACKING 60"

20001-129b FLEXCO BELT SPLICE #187 SJ 60

20001-129e BELT SPLICE TOOL FLEXCO #C187-6

20001-18a TAKE-UP BLOCK, REXNORD MT8-2207 2
7/16" Ø BORE

20001-18b DODGE CONVEYOR PULLEY 14" Ø x 63"
CROWNED, Q.D. "E" HUB

20001-18c Q.D. BUSHING "E" 2 7/16" Ø BORE PL.

20001-18d 2 PC. SHAFT COLLAR S.S. 2 5/16 Ø x
3/4" WIDE

20001-18e 11 OZ. TUBE SEALANT, GEOCEL CLEAR

20001-126a DODGE DRIVE PULLEY 24" Ø x 63" LG.
CROWNED Q.D. "E" HUB W/ 1/2"
HERRINGBONE GROOVED LAGGING

20001-126b PILLOW BLOCK, REXNORD MAS-2300-F 3" Ø
BORE, EXPANSION

20001-126c PILLOW BLOCK, REXNORD MA-2300-F 3" Ø
BORE

20001-126c Q.D. BUSHING "E", 3" Ø BORE

20001-126e 11 OZ. TUBE SEALANT, GEOCEL, CLEAR

20001-126f DODGE TAPERLOCK SPROCKET #TLB1028

20001-126g DODGE TAPERLOCK BUSHING 117134 3" Ø
BORE

20001-119a 10-DIAMOND WALKWAY, 24" WIDE x 12'-0
LG, 14 GA. GRIP STRUT #1045144

20001-119b GRIP STRUT SPLICE KIT #SP-10DU-30

20001-119c GRIPO STRUT DIAMOND ANCHOR #12262

20004-23a PUMP KSB #PNT 550, 890 RPM 95 HP,
460V/3Ø/60HZ 2300 6PM AT 11 FT HEAD

20004-10A PUMP BICKNELL #1838, HAYWARD
#SP2615X20 (2x2)-2 HP W/TRAP

20004-10d SUCTION SCREEN 2" NPT HAYWARD
EFU10200SA, PVC

20010-01a PUMP-3HP PEERLESS #C820 AM, 1760 RPM
460V 3PH 60HZ 2 1/2" SUCTION, 2"
DISCHARGE

20010-01b 36" SAND FILTER, BAKER #3239, W/2" 6
POSITION HAYWARD VALVE

20010-01c FILTER MEDIA (#20 SILICA SAND)
(800 LBS.)

20010-01d SUCTION SCREEN, 3" (PVC) HAYWARD #FV
10300SA

20010-01e BALL TYPE CHECK VALVE 3" (PVC)
HAYWARD #PB 10300SE

20001-25u HOSE 3/8" PH. #801-6 x 4'-0 LIN. FT.
"RED"

20001-25v BUSHING, 1/2" x 3/8" NPT (GALV)

20001-25w NIPPLE 1" MALE NPT-1" HOSE SHANK
McMASTER-CARR #5363K73

20001-25x HOSE-1" HYDRAULIC (2) WIRE x12" LG.

20005-13a AIR CYLINDER CLASS 2 STYLE "E" BORE
4" x 12" EFF. STROKE 1 1/4" ROD W/
1-14 THD., NOPAK

20005-13b CLEVIS, NOPAK #4332cy

20005-13c PIN, NOPAK, #3253-cy-4

20005-13f FLANGED BEARING, 1 1/4" I.D. x 1 1/2"
O.D. x 1 3/4" LG. (BOSTONE #FGS 2024-
12)

20005-13g THREADED SHOULDER EYE BOLT #8891T79
McMASTER-CARR

20005-13h DOUBLE CLEVIS LINK 9/16" x 1"
#3562T11, McMASTER-CARR

20005-13i 5/16" (GALV) STEEL CHAIN x 4'-0 LG.

20005-16a AIR CYLINDER, CLASS 2, STYLE "E" BORE
4" x 12" EFF. STROKE 1 1/4" ROD 1-14
THD. NOPAK

20005-16b CLEVIS, NOPAK #4332-C4

20005-16c PIN, NOPAK #3253-cy-4

20008-26A FIBERGLASS HULL (3 BLUE, 3 YELLOW, 3 RED)

20008-25a PLASTIC PLUG, "ROBROY" #5m-1 1/4", BLACK

20008-25b CHROME EYE STRAP, 5/16" JAMESTOWN #5D081275

20008-25c DRAIN, "JR. SHOWER STRAINER," #641-003B JR., COAST CONN. RV PARTS CAT #23285

20008-25d SILICONE SEALANT

20008-25e BOW EYE BOLT, MANSET MARINE #ATT8485, 3/8-16

20008-25na 3/8-16 ELASTIC STOP NUT (PL)

20008-25nb 3/8-16 KNURLED, PRESS NUT, FLAG FASTENER #916NKC-(.125)

20008-25nc #10-32 THREADED INSERT, SLOTTED, S.S. "GROOVE-PIN" H-19032-50

20008-25nd 1/4-20 ELASTIC STOP NUT (PL)

20008-25ba 3/8-16 x 1 1/2" LG. SOCKET BUTTON HEAD C.S. (PL)

20008-25bb 3/8-16 x 1 1/4" LG. SOCKET BUTTON HEAD C.S. (PL)

20008-25ra 3/16 x .7 WIDE FLANGE, DOMED HEAD
RIVIT, (3/8-1/2 GRIP) PL. ST'L.

20008-25rb 3/16 x .825 WIDE FLANGE, DOMED HEAD
RIVIT, (1/2-5/8 GRIP) PL. ST'L.

20008-36f DEVON CLEANER (1QT) CON REMA. COLD
VULCANIZING

20008-36g DEVON FL-10 PRIMER (1PT) METAL PRIMER

20003-27a 2-TON ELEC. HOIST 460V/3Ø/60HZ, 2
BUTTON 24V W/15 LIN. FT. CABLE

20003-27b TROLLEY FOR ABOVE TO FIT W21 x 44

20003-28a 2-TON ELEC. HOIST 460V/3Ø/60HZ, 2
BUTTON 24V, W/15 LIN. FT. CABLE

20008-28b TROLLEY FOR ABOVE TO FIT W21 x 44

20006-45c CLAMPING NUT 3/8 McMASTER-CARR
#3310T24

20003-21a AIR COMPRESSOR GARNER DENVER MODEL
#ASKRJ, 250 PSI MAX, WORK PRESSURE,
215 CFM, FREE AIR, 80 GAL. HORIZ
RECEIVER, 7 1/2 HP, OPEN DRIP PROOF
460V/3Ø/60HZ ELECTRIC MOTOR BELT
GUARD, AUTO START/STOP PRESSURE GAUGE
AND PRESSURE RELIEF VALVE

20003-21b GATE VALVE, 1" NPT, BRASS, 250 PSI

20003-21c FILTER 1" NPT, PARKER MODEL #085-5-4-A

20003-21d LUBRICATOR 1" NPT, PARKER MODEL
#18L-5-4-B

20003-21e REGULATOR 1" NPT, PARKER MODEL
#08R-15-A

20003-21f PRESSURE GAUGE, 2" FACE, 0-300 PSI,
1/4 NPT BOTTOM CONNECTION, PARKER
MODEL #P781643

20003-21h DIRECTIONAL CONTROL VALVE, 4-WAY, 2
POSITION, SINGLE SOLENOID, 24VDC, 1/2
NPT PORTS, PARKER #4520A-D30-A-AAE-49
OR AAA #S04

20003-21j DIRECTIONAL CONTROL VALVE, 4-WAY, 3
POSITION DETENTED, MANUAL, 1/2 NPT
PORTS, PARKER # NOT AVAILABLE OR AAA
#HD4

20003-21k GATE VALVE, 1/2 NPT, BRASS, 250 PSI

20003-21m LUBRICATOR, 1/2 NPT, PARKER MODEL
#17L-3-4-B

20003-21n EXHAUST SILENCERS "MUFFLERS", 1/2
NPT, PARKER #ES-50m

20003-21p OIL TRAP FILTER W/MANUAL DRAIN, 1/2
NPT PARKER #12F-3-1-G

20003-21q GATE VALVE, 3/8 NPT, BRASS, 150 PSI

20003-21ha HOSE 1/2" I.D., "RED" AIR/WATER 200
PSI

20003-21fa MALE PIPE PUSHLOCK 1/2" I.D. HOSE TO
1/2" NPT (BRASS) 301828-8-B

20003-21fb TEE 150 LBS, BRASS 1/2 NPT (FEMALE)

20003-21fc BUSHING, 1/2 NPT x 3/4 NPT (BRASS)

20003-21ca HOSE CLAMP TO FIT 7/8 O.D. HOSE
(STAINLESS)

20003-21d PRESSURE SWITCH, ALLEN BRADLEY #836-
A3A 50-250 LBS.

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SECTION 11

TECHNICAL INFORMATION FOR PURCHASED PARTS

The following information is included with this manual to provide additional installation and maintenance instructions for components of the ride that were purchased from commercial vendors.

SEE OTHER BOOK
PURCHASED PARTS
INFORMATION

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