

Dartron
INDUSTRIES, INC.

Dartron, Inc.
"Cliff Hanger"
Non-Kiddie

February 11, 1999

To Whom It May Concern: *Carlos Corvo*

On Cliff Hanger rides manufactured before the ride manufactured for Amusements of America Dartron inserted a safety cable inside the hanger stem and connected this cable to the passenger carrier. On midways the ends of the cable tended to come loose from the tube and created the potential of scratching or cutting patrons. For this reason Dartron has discontinued the use of the cable and replaced it with a safety pin that acts as a backup for the pin that holds the hanger stem to the lower hanger block. The pivot bolts that attach the hanger stem to the car are backed up with chains that attach the passenger carrier to the stem.

We mistakenly provided Amusements of America a manual that did not reflect these changes. Please remove Page 13 from Amusements of America's manual and replace it with the revised Page 13 dated 1-29-99.

Sincerely,

Bob Coil

J. Robert Coil, President

JRC:wkc
Enc.: Revised Page 13

*Mike, this is the
manual for this ride.
Enclosed you will
find a revised page
13, when I inspected
the ride, paragraph No.
2, mentioned safety
cables and I could
not find. Corvo*

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PRE-OPERATION INSPECTION

MUST BE PERFORMED DAILY BEFORE ALLOWING PASSENGERS ON RIDE

1. Visually inspect all passenger carriers to ensure "R" keys are in place and correctly positioned On: (1) hanger stem to lower hanger block pin, (2) sail attaching pins, (3) hanger stem to passenger carrier body strut pins located under passenger carrier, (4) pins that connect boom to hub.
2. Inspect safety cables attached to sail hanger pins. Look for wear and ensure the cable is capable of supporting passenger carrier if hanger stem to hanger block pin is removed.
3. Lubricate bushings and bearings as specified in the Lubrication Chart.
4. Inspect hydraulic hoses for leaks.
5. Inspect the level of hydraulic fluid in the reservoir. Fluid level must be at least to the middle but not above the middle of the upper half of the sight gauge. If overfilled, the tank could overflow onto the ground.
6. Inspect all blocking. Tighten all screw jacks and ensure that blocks cannot be moved.
7. Go to each passenger carrier and close and then open all restraints.
From operator's console start electric motor. Allow hydraulic fluid to reach operating temperature. Operating temperature is achieved when pump becomes quiet.
9. Test ride rotation by operating ride with Mode Selector Switch in the Auto position. Next operate the ride in the Manual Mode.
10. Test electrical power loss emergency shutdown system. Push in Emergency Stop. (a) Shunt in main panel will trip breaker. (b) Ride will shift into a free wheel mode and stop turning. (c) Lower boom to boom rest by opening manual Boom Down Valve located next to hydraulic reservoir.
Before restarting electric motor, reset breaker handle on outside of main panel, pull Emergency Stop button UP and move Rotation Engage switch to the ON position.
11. Test hydraulic braking system by attempting to move cars fore and aft and side to side and by trying to push the ride forward in its circle by hand.

PRE-OPERATION INSPECTION

MUST BE PERFORMED DAILY BEFORE ALLOWING PASSENGERS ON RIDE

1. Visually inspect all passenger carriers to ensure "R" keys are in place and correctly positioned on: (1) hanger stem to lower hanger block pin, (2) safety pin located about 2" below hanger stem to lower hanger block pin, (3) sail attaching pins, (4) hanger stem to passenger carrier body strut pins located under passenger carrier, (5) pins that connect boom to hub.
2. On the passenger carrier inspect the chains located at the base of the hanger stem. The chains must be attached to both the hanger stem and the passenger carrier.
3. Visually inspect the area where the upper hanger block connects to the end of the sweep. At this location on the end of the sweep a bolt locates the upper hanger block shaft. Inspect this bolt to ensure that it has a standard nut, a Nyloc nut, and cotter pin.
4. Lubricate bushings and bearings as specified in the Lubrication Chart.
5. Inspect hydraulic hoses for leaks.
6. Inspect the level of hydraulic fluid in the reservoir. Fluid level must be at least to the middle but not above the middle of the upper half of the sight gauge. If overfilled, the tank could overflow onto the ground.
7. Inspect all blocking. Tighten all screw jacks and ensure that blocks cannot be moved.
8. Go to each passenger carrier and close and then open all restraints.
9. From operator's console start electric motor. Allow hydraulic fluid to reach operating temperature. Operating temperature is achieved when pump becomes quiet.
10. Test ride rotation by operating ride with Mode Selector Switch in the Auto position. Next operate the ride in the Manual Mode.
11. Test electrical power loss emergency shutdown system. Push in Emergency Stop and immediately pull back up. (a) Shunt in main panel will trip breaker. (b) Ride will shift into a free wheel mode and coast to a stop. (c) Lower boom to boom rest by opening manual Boom Down Valve located next to hydraulic reservoir.
Before restarting electric motor, pull Emergency Stop button UP, move Rotation Engage switch to the OFF position, set controls to Manual operation, and reset breaker handle on outside of main panel.
12. Test hydraulic braking system by attempting to move cars fore and aft and side to side and by trying to push the ride forward in its circle by hand.

Revised 1-29-99

CLIFF HANGER

OPERATION
AND
MAINTENANCE
MANUAL

DARTRON INDUSTRIES, INC.

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INTRODUCTION

This manual is intended to be used as a general guide for the operation and maintenance of your ride. Dartron Industries, Inc. 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 this manual.

MANUFACTURER'S LIMITED WARRANTY

Dartron Industries, Inc. warrants that purchased property is free from all defects in material and workmanship at the date of delivery and for 12 months thereafter. Dartron Industries, Inc. does not warrant that purchased property will meet or exceed federal, state and local design criteria or electrical codes. Dartron Industries, Inc.'s liability is hereby limited to the repair or replacement of any equipment, accessory or part which is defective due to material failure or workmanship. The cost of returning defective parts to Dartron Industries, Inc. and the cost of transportation of repaired or replaced parts to Purchaser shall be born by Purchaser. Dartron Industries, Inc. shall not be liable for down time or loss of operating revenue or any other commercial consequential damages. Losses resulting from improper maintenance or failure to observe Dartron Industries, Inc.'s operating instructions are expressly excluded from this warranty. Purchaser hereby acknowledges receipt of current operating, maintenance and erection instructions, a copy of which is attached to this agreement and made a part hereof.

It is expressly understood between Dartron Industries, Inc. and Purchaser that all warranty is void and Dartron Industries, Inc. disclaims any and all liability or responsibility for failure, loss or damage if device is assembled, maintained or operated other than as recommended in the Manual provided with each device or is loaded or operated in excess of the operator's operating criteria set out in the appropriate manual.

THIS WARRANTY, AND THE OBLIGATIONS AND LIABILITIES OF DARTRON INDUSTRIES, INC. HEREUNDER ARE IN LIEU OF ALL OTHER WARRANTIES, GUARANTEES, CONDITIONS OR LIABILITIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND SHALL NOT BE EXTENDED, ALTERED OR VARIED EXCEPT BY WRITTEN INSTRUMENT SIGNED BY DARTRON INDUSTRIES, INC. AND PURCHASER.

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CLIFF HANGER SPECIFICATIONS

| | |
|--------------------------------------|---|
| PASSENGER MINIMUM HEIGHT REQUIREMENT | 46 inches |
| RESTRICTIONS ON RIDERS | No: pregnant women, people with heart conditions, people under the influence of drugs or alcohol |
| CAPACITY | 625-750 customers per hour |
| MAXIMUM LOAD | 5,400 lbs. |
| CAPACITY | Ten passenger carriers for 3 adults or children. Total capacity of 30. |
| RIDE SPEED | Recommended 11 rpm; Maximum 12.5 rpm; Minimum N/A; |
| MINIMUM OVERHEAD CLEARANCE | 45' |
| SPACE REQUIRED FOR FENCE | 63' front, 72' deep |
| TRAILER LENGTH | 28' |
| TRAILER WIDTH | 8' 6" |
| TRAILER ROAD HEIGHT | 13' 6" |
| LIGHTING | Sweep lights 10w ASL - 980 ct Bow lights 10w ASL - 1280 ct Center Ornament 10w ASL- 357 ct Entry Sign 10w - 109 ct Floods 175w Metal Halide-10 ct |
| ELECTRIC MOTOR | 50 hp, 1750 rpm, electric motor |
| POWER REQUIRED | 80 KW |
| VOLTAGE | 220 v 3-phase with ground |
| POWER SOURCE BREAKER | 225 amp circuit breaker |
| DIRECTION OF ROTATION | Counter Clockwise |
| ELECTRICAL LEAD WIRES | Five individual wires with type W insulation. Power & ground wires are 1/0 size. |

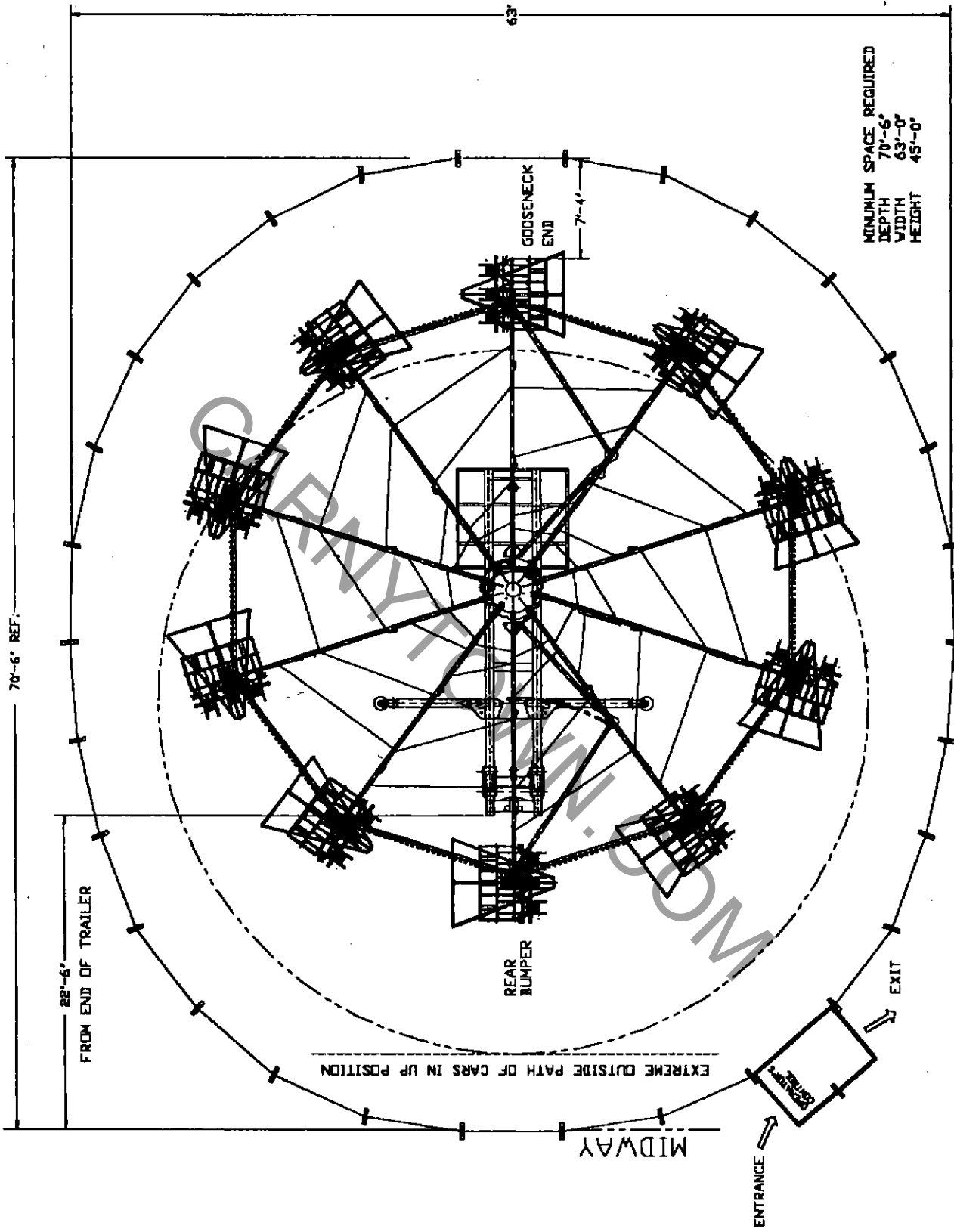
⚡ CAUTION: Failure to supply an adequate ground to the frame can cause serious electric shock. Proper grounding prevents the metal parts of the Cliff Hanger from being energized with high voltage in the event of a short circuit. The leads supplied with the Cliff Hanger contain a ground wire that must be connected to ground at the power supply. Another means of grounding is with a ground rod. Check local regulations for ground rod requirements.

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SPACE AND FENCE DIAGRAM

WITH ENTRY GATE SITUATED OFF-CENTER IN FRONT OF RIDE

70'-6" REF.

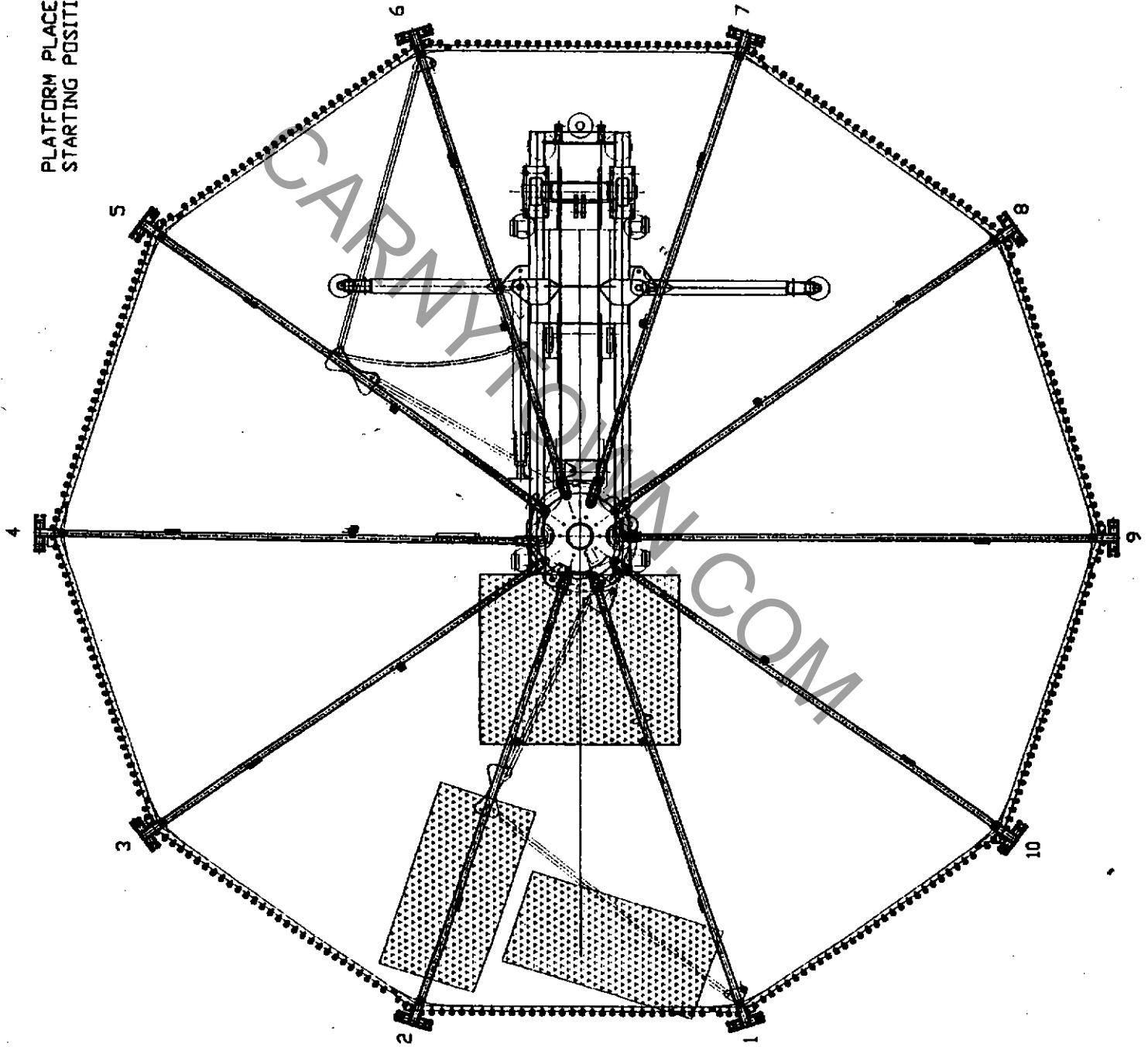


MINIMUM SPACE REQUIRED
 DEPTH 70'-6"
 WIDTH 63'-0"
 HEIGHT 45'-0"

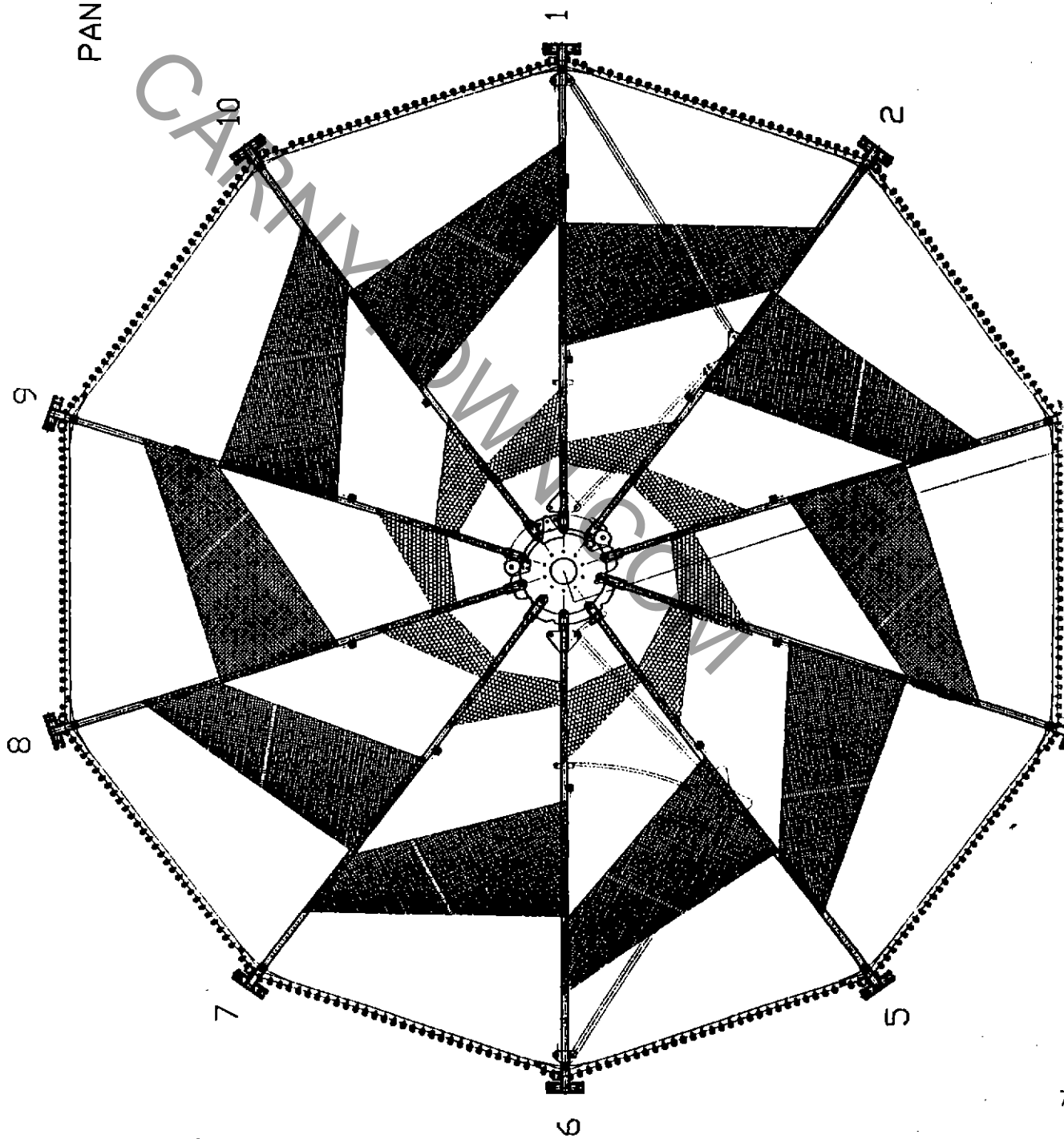
THE CLIFFHANGER MUST HAVE A CLEARANCE OF 45 FEET OVERHEAD.
 THE PASSENGERS MUST NOT BE ABLE TO REACH OUT AND TOUCH TREES,
 BUILDINGS, LIGHT OR TELEPHONE POLES, SIGNS OR POWER LINES AT
 ANY POINT DURING THE OPERATION OF THE RIDE.

| | | | |
|-------------------|--------------|-----------------------|--------------|
| DARTON RIDE, INC. | | SPACE & FENCE DIAGRAM | |
| DATE | 1/11/50 | SCALE | 1/4" = 1' |
| BY | J. W. DARTON | CHECKED | J. W. DARTON |
| APPROVED | J. W. DARTON | DATE | 1/11/50 |

PLATFORM PLACEMENT AND SWEEP
STARTING POSITION FOR RACKING DIAGRAM



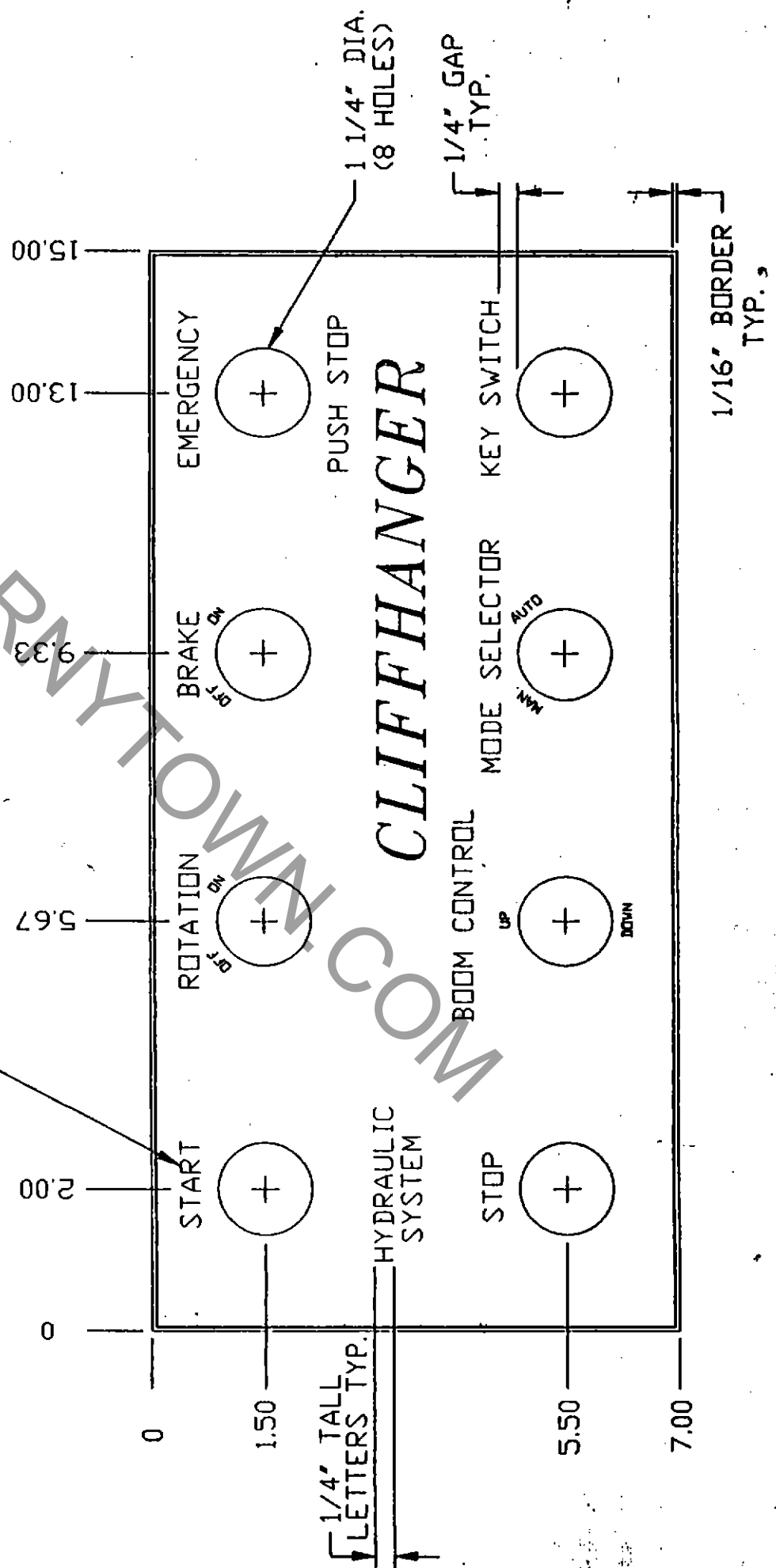
PANELS BETWEEN SWEEPS



| ITEM | QTY. | DESCRIPTION | LENGTH | OPER. | COMPONENTS | USED |
|---------|------|---|--------|-------|------------|------|
| M-793-1 | 1 | 1/16" THICK X 7" WHITE PLASTIC V/ RED COVER | 15" | F | 0 | ALL |

CARRYDOWN.COM

RED W/ WHITE LETTERS



CLIFFHANGER

1/16" BORDER
TYP.

SET UP INSTRUCTIONS

A. Prepare for ride set up

1. CONNECT ELECTRICAL LEAD Remove electrical lead cable from its rack. Connect 3-phase 5 wire electrical leads to electrical power source. The following preparation can be made prior to electrical hookup.

2. SET UP Cliff Hanger OPERATING CONTROL CONSOLE. Remove console electrical cable and dead man foot control from its storage area in the set up platforms. Place end of cord at desired location for control stand. Remove ride control stand, located on the streetside outrigger, and move to the desired location. Adjust height of control stand. Connect electrical cord to bottom of control stand.

3. LEVEL AND SUPPORT TRAILER.

a. Using rear landing gear, raise the trailer until some weight is transferred to landing gear. CAUTION: DO NOT LIFT TIRES OFF GROUND. Level trailer using front and rear landing gear.

b. Lower screw jacks mounted under rear bumper until some weight is transferred from rear landing gears to screw jacks.

c. Lower front screw jacks mounted next to front landing gear until some weight is transferred from landing gears to front screw jacks.

d. Set up outriggers by removing pins, rotating outriggers to rear and pinning in place. Remove pins from screw jacks located on the end of the outriggers. Rotate screw jacks into position and pin in place. Screw down sand shoe. Maintaining trailer in level position raise rear landing gear so that most of the weight of the ride transfers to rear screw jacks and the outriggers. Maintain some weight on rear landing gear.

4. SET UP WHEEL ASSEMBLY PLATFORMS.

Caution: When removing platforms from possum belly of trailer, lift only one platform at a time.

Remove platforms from the streetside of trailer. Slide platforms partially out of rack, insuring that one end of platforms remains supported by possum belly rack, and other end is supported on a board or block so that platform is level. Remove top platform and carry to position outside the ride circle. (See Platform Placement Diagram, Page 5). Carry bottom platform and place outside sweep circle. Remove feet, braces, pins and turnbuckles from bottom platform. Place pins on rear wheel fenders. Erect the platforms.

5. SET UP FENCE. Feet, stored in bottom platform assembly, are to be located where fence is desired. Remove fence from rear fenders and install in feet.

NOTE: The remainder of the set up steps require electrical power.

B. LOWER PASSENGER CARRIER RACKS AND SPREAD SWEEPS AROUND HUB

1. START HYDRAULIC SYSTEM. Be sure rotation switch is in the OFF position, and the BRAKE switch is in the ON position. On control console depress button labeled HYDRAULIC SYSTEM START. See Console Diagram, Page 8. Before operating pump be sure it is rotating in the correct direction. An arrow is stamped on top of the rear C-face flange, next to the pump servo housing. The pump must turn in the same direction as the arrow points. If the pump is turning the wrong direction turn off the pump and reverse lead wires at the generator.

2. LOWER PASSENGER CARRIER RACKS.

NOTE: The hydraulic control levers used to raise and lower the passenger carrier storage racks are located at the rear streetside of gooseneck platform. When using hydraulic control levers, depress override button found on end of box containing levers. Hold the button in while the levers are being used.

WARNING: BEFORE LOWERING RACKS WITH HYDRAULIC CONTROL LEVERS, BE SURE TO REMOVE THE TWO PINS IN EACH RACK THAT HOLD RACKS IN TRAVEL POSITION. FAILURE TO REMOVE THESE PINS BEFORE OPERATING COULD CAUSE DAMAGE TO RIDE COMPONENTS.

Using the hydraulic control lever and override button, lower both passenger storage racks until the cylinder stops moving.

One passenger carrier is transported on the gooseneck platform. Remove this carrier now and place outside the sweep circle.

3. RELEASE SWEEPS FROM TRANSPORT POSITION. Lower rear sweep support bar all the way down by turning crank of gear jack, located at curb side of rear end of trailer. Unpin sweep support bar from jack and remove. Remove flat bar braces from between Sweeps #1 and # 10 and boom. Store flat bar braces on side of boom.

4. FAN SWEEPS TO FRONT. Rotate Sweeps # 9, 10, 1 and 2 from the rear of trailer to the front gooseneck platform. Once Sweeps # 9, 10, 1 and 2 are to the front, move the split hub pivot wings into place and prepare to pin both top and bottom hub plate by removing top and bottom pin..

5. PIN SPLIT HUB PIVOT WINGS Move Sweeps # 10 and # 1 toward each other until the holes in the lower split hub wings line up with holes in the lower hub. Pin lower hub and install R key. The pin used to prevent movement of the hub during

shipment must be removed. This pin is removed by standing on gooseneck platform and locating pin found on center of lower hub plate. Remove and store.

To pin upper split hub pivot wings, remain on the gooseneck platform and position the split hub lifting tool in its receiver tube located on the center of the hub plate immediately above the split wings. Attach the tool to one split hub and rotate tightening nut, which will lift the split hub and enable the pin to pass through. Place R key in pin. Repeat this operation on the remaining split hub.

C. ASSEMBLE BOWS, "Z" BRACES AND SWEEP PANELS

1. INSTALL "Z" BRACES Go to Sweeps # 1 and 2 and unpin and rotate brace to its operating position as shown on Page 5. Secure pins with R key.

2. INSTALL BOW # 2 Unpin Bow # 2 from the side of Sweep # 2. Supporting some of the weight of Bow # 2, swing it to a position close to the end of Sweep # 1 and pin it to the end of Sweep # 1.

3. INSTALL REMAINING BOWS AND "Z" BRACE. Remain on the platform and rotate ride in a clockwise direction until the next pair of sweeps are over the set up tables. Install the bow as in No. 2 above. Repeat this operation until all bows and the remaining "Z" are installed.

D. INSTALL PANELS BETWEEN SWEEPS

Located on the gooseneck platform is a 5' long box. Open the box and remove one rolled up panel. The small panel that goes next to the hub is rolled with the larger panel. Install the panels as shown on Page 6. Be sure that the edge of the panel with 3 grommets is placed on the sweep that leads in rotation. Pin this edge in place first. Unroll the panel and locate the edge with 4 grommets on the opposite sweep which follows when the ride rotates. Locate the small panel as shown on Page 6.

E. INSTALL SAILS

Open the door on the sail storage box mounted above the rear bumper. Remove a sail from the storage box. Do not expand the sail frame at this time. Insert the hanger block mounted on the end of the sweep through the opening in the sail frame. Face the narrow end of the sail in the direction of travel of the ride. Secure bonnet to hanger block by inserting two pins from the inside of the ride to the outside. Install R keys so they are visible from outside the ride.

F. INSTALL PASSENGER CARRIERS ONTO HANGER BLOCKS

1. Install the passenger carrier that is transported on the gooseneck platform and was placed outside the sweep circle in

PRE-OPERATION INSPECTION

MUST BE PERFORMED DAILY BEFORE ALLOWING PASSENGERS ON RIDE

1. Visually inspect all passenger carriers to ensure "R" keys are in place and correctly positioned On: (1) hanger stem to lower hanger block pin, (2) sail attaching pins, (3) hanger stem to passenger carrier body strut pins located under passenger carrier, (4) pins that connect boom to hub.
2. Inspect safety cables attached to sail hanger pins. Look for wear and ensure the cable is capable of supporting passenger carrier if hanger stem to hanger block pin is removed.
3. Lubricate bushings and bearings as specified in the Lubrication Chart.
4. Inspect hydraulic hoses for leaks.
5. Inspect the level of hydraulic fluid in the reservoir. Fluid level must be at least to the middle but not above the middle of the upper half of the sight gauge. If overfilled, the tank could overflow onto the ground.
6. Inspect all blocking. Tighten all screw jacks and ensure that blocks cannot be moved.
7. Go to each passenger carrier and close and then open all restraints.
 - . From operator's console start electric motor. Allow hydraulic fluid to reach operating temperature. Operating temperature is achieved when pump becomes quiet.
9. Test ride rotation by operating ride with Mode Selector Switch in the Auto position. Next operate the ride in the Manual Mode.
10. Test electrical power loss emergency shutdown system. Push in Emergency Stop. (a) Shunt in main panel will trip breaker. (b) Ride will shift into a free wheel mode and stop turning. (c) Lower boom to boom rest by opening manual Boom Down Valve located next to hydraulic reservoir.

Before restarting electric motor, reset breaker handle on outside of main panel, pull Emergency Stop button UP and move Rotation Engage switch to the ON position.
11. Test hydraulic braking system by attempting to move cars fore and aft and side to side and by trying to push the ride forward in its circle by hand.

OPERATING INSTRUCTIONS

I. MANUAL OPERATION OF RIDE

PLACE MODE SELECTION SWITCH IN MANUAL POSITION.

1. To start motor and hydraulic system push button labeled **HYDRAULIC SYSTEM ON**. Allow system to warm up until the temperature of the hydraulic system reaches 50 degrees. Hydraulic fluid will warm up before temperature gauge indicates 50 degrees because the gauge is exposed to the open air. Hydraulic pump will quiet down when fluid is warm enough.

CAUTION: WHEEL SHOULD NEVER BE ROTATED WHILE THE WHEEL IS AT GROUND LEVEL. ROTATING THE WHEEL AT GROUND LEVEL COULD CAUSE INJURY TO PASSENGERS OR DAMAGE TO EQUIPMENT. ELECTRONIC CIRCUITRY PROHIBITS THE WHEEL FROM ROTATING UNTIL BOOM HAS RISEN TO A PRE-SET POSITION ABOVE THE GROUND. IF WHEEL CAN OPERATE OR CREEP AT GROUND LEVEL, CONTACT DARTRO INDUSTRIES IMMEDIATELY FOR INSTRUCTIONS ON REPAIRS REQUIRED.

2. Place rotation switch in the ON position.

3. Move joy stick to the UP position. Boom will rise to a pre-set position and stop. Wheel rotation will start at this time. Continue to hold joy stick in the UP position. Boom may not rise immediately because a timer delays upward movement until adequate rotation speed is achieved. After the boom starts to rise, it will continue until it reaches its maximum height and then will stop by itself. Release joy stick after upward movement of the boom stops.

5. When ready to end ride, turn **ROTATION** switch to OFF and immediately place joy stick in DOWN position. Boom will lower to a level several feet above the trailer and stop. Keep the joy stick in the DOWN position. A timer will keep the ride from moving down until rotation has stopped and then allow the ride to move down to its unload position. After boom downward movement stops, release joy stick.

II. AUTOMATIC OPERATION OF RIDE

1. Place **MODE SELECTOR** switch in **AUTO** position. Turn **Rotation Switch** to the **ON** position. Move joy stick to the **UP** position. Boom will move up until it stops at the lower limit switch position. Until the boom reaches the lower limit switch position, its upward movement can be stopped by releasing the joy stick. The boom can be lowered by placing the joy stick in the **DOWN** position.

2. After the boom stops at the lower limit switch position, the ride operation will be controlled by the automatic control. The ride can be stopped any time by turning the rotation switch to the **OFF** position.

SYSTEM OVERRIDE AND EMERGENCY PROCEDURES

- I. Passenger carrier restraint latches do not open.

Locate slot on front face of latch plate. Insert screw driver into slot. This action will release latch.

- II. Electrical or hydraulic power is interrupted while wheel is in position.

When electrical or hydraulic power is interrupted, holding valve located on the boom lift cylinders will close, trapping hydraulic fluid in the lift cylinders and maintaining the boom at that location. To lower boom without hydraulic or electrical power, locate the lift cylinder valve override handle located inboard of cooling fan on the rear of the hydraulic fluid storage reservoir. The override handle is about 5" long with a rounded end. Rotate the handle 90 degrees. This action will allow hydraulic fluid to slowly exit the boom lift cylinders to gently return to the boom rest pad. **CAUTION:** After lowering boom return override handle to closed position. With override handle in open position boom cannot be raised.

- III. Ride occupant creates a situation requiring the ride motion to be stopped immediately.

From the operator's console place the switch marked MODE in the Manual position. Turn the rotation selector to the OFF position. Lower the Boom using the Joy Stick.

- IV. Ride operator sees an electrical problem and needs to stop the ride and interrupt electrical power.

Push down mushroom head button labeled EMERGENCY STOP. Main breaker for all electrical power is tripped allowing wheel to rotate in a freewheel mode until it stops. To operate ride after using emergency stop button the EMERGENCY STOP button must be pulled up; then the breaker must be reset to its original position.

- V. After stopping wheel, ride operator chooses to unload all cars.

If electrical power has not been interrupted, lower boom by moving joy stick toward bottom of operator's console. If electrical power has been interrupted, lower boom by opening lift cylinder valve override handle located inboard of the cooling fan.

- VI. If power is interrupted from loss of power at source or by pushing EMERGENCY STOP mushroom switch, the wheel will immediately free wheel for several seconds.

CAUTION: AFTER OPENING LIFT CYLINDER OVERRIDE VALVE, BOOM WILL NOT STOP IN THE AIR UNTIL VALVE HAS BEEN CLOSED.

RACKING

A. Prepare to rack ride.

1. Leave power connected to ride.
2. Rotate ride until junction for the two split hubs is in the center of the gooseneck platform.
3. At the rear of the trailer pull bumper out to its fully-extended position and pin in place for travel.
4. Remove sail transport box from beneath ride and install on rear of the trailer above bumper. Set box on the bumper extension and rotate up until pivot pin drops into retainers on trailer. Rotate the box into place and pin upper ears.
5. Remove passenger carriers and sails.

Below is procedure for removing passenger carriers and sails. All are removed in the same manner.

a. REMOVE Passenger carrier.

Rotate handle bars under beds and pin into their travel position.

Remove passenger restraints by removing the nut on the restraint hinge bolt. Remove the hinge bolt from its retaining tube. Move the restraint forward until it drops as low as possible on the beds. Return the hinge bolts to their retaining tubes and replace the nuts.

Two struts span between the passenger carrier stem and the bed. From underneath the bed remove the pins retaining these struts and allow the car to pivot to a vertical position. Replace the pins in their ears. If the car strikes the ground before achieving a vertical position, rotate the car forward.

Obtain passenger carrier transport clamps from their storage area. Place clamps in position to clamp together the stem restraint and beds.

Remove passenger carrier hanger pin and carry passenger carriers to their transport rack. Place passenger carrier into the rack located on gooseneck platform.

b. Remove sails.

Move to rear of the trailer and open sail transport box.

With sails attached to the hanger blocks, remove bail pin at end of sail and slide leading edges of sail toward center while pushing the center slide forward. This will collapse the sail to its travel position.

Remove two pins that attach the sail to the hanger block. Place sail in its transport rack. Two sails should be placed in each slot.

- c. Using the above procedures, remove and rack passenger carrier and sails.
6. Prepare to disassemble and rack bows, "Z" braces, and sweep panels
- a. Remove wheel assembly platforms from possum belly of trailer. Remove retaining pins and slide both tables from the streetside of trailer. Slide tables out, insuring that one side of table remains supported by possum belly rack and support other side on a board or block so that tables are level.
 - b. Set up both tables and locate as shown in Platform Placement Diagrams on Page 5.
 - c. Remove panels. Move down the tables and stand on gooseneck platform. Remove small sweep panel and place it on top of large sweep panel. Position one person at one end of the short edge of the large sweep panel and the other person at the other end. Remove short edge of panel from sweep, leaving the other edge attached, and roll both panels toward the attached edge. Remove the attached edge and store rolled panel in aluminum box on gooseneck panel.

Continue to rotate wheel and repeat the above steps until all sweep panels are rolled and placed in their transport box.
 - d. Position wheel so that Sweep No. 1 is over streetside corner of gooseneck platform and Sweep No.2 is over curbside corner of gooseneck platform.
 - e. Disassemble and rack the bows and "Z" braces. Remove "Z" brace pins. Rotate to transport position and pin.
 - f. Remove pin that holds the bow to the sweep.
 - g. Swing bow inward until it touches its sweep. Remove R key from attaching pin and pin bow to sweep.
 - h. Continue to rotate wheel and repeat the above steps until all bows and "Z" braces are positioned in their travel location.

9. STOW SWEEPS TO REAR OF TRAILER

- a. Rotate wheel until junction of split hub is facing 12 o'clock position. Center point between Sweeps # 5 and 6 must be located over sail transport box.
- b. Move to gooseneck platform. Remove upper pins that secure split hub pivot wings using tool attached to upper hub plate to unweight the upper hub plate.
- c. Swing Sweeps # 9 and 10 toward the rear of the trailer until they touch the adjoining sweeps. Swing Sweeps # 1 and 2 toward the rear of the trailer until they touch the adjoining sweeps.
- d. Using crank handle, raise sweep support brace until all sweeps are supported. Raise brace only enough to unweight sweeps.
- e. Install pin in front center of lower hub plate to prevent movement of the hub during shipment.
- f. Use flat bar brace to attach Sweep # 1 to boom. Use second flat bar brace to attach Sweep # 10 to boom.

10. STOW PASSENGER CARRIERS ON GOOSENECK PLATFORM

- a. Place a passenger carrier on the deck of the gooseneck platform and pin into its rack.
- b. Using hydraulic controls located on rear streetside of gooseneck platform, raise curbside passenger carrier storage rack until the rack movement stops.
- c. Now raise the streetside passenger carrier storage rack until it stops.
- d. Attach passenger carrier racks together at both front and rear using turnbuckles between ears on the racks.

WARNING: YOU MUST CONNECT AND TIGHTEN LOCKING TURNBUCKLE BETWEEN CURBSIDE PASSENGER CARRIER STORAGE RACK AND STREETSIDE PASSENGER CARRIER STORAGE RACK

11. STOW MISCELLANEOUS ITEMS

- a. Stow outriggers by loosening sand shoes, removing pins, rotating screw jacks upward, and pinning in place. Remove pins from rotation points and rotate outriggers against trailer and pin in place.
- b. Using rear landing gear, raise the trailer until screw jacks mounted under rear bumper are loose. Rotate screw jack feet up until they retract fully. Retract rear landing gear until it is in the travel position and all trailer weight is on the rear tires.
- c. Using front landing gear, raise the trailer until front screw jacks

- are loose. Rotate screw jack feet up until they retract fully.
- d. Install half of fence on curbside on rear fender and remaining fence on streetside rear fender. Hold in place with bracket located in those positions.
 - e. Turn both tables upside down and fold legs. Carry one table to streetside of ride and insert table open side up in possum bell tracks and prop up other end with blocks. Carry the second table and install open side down on top of other table. Pin table halves together. Shove into possum belly and pin into place.
 - f. Disconnect electrical power. Install lead cord bracket on curbside outrigger. Wind lead cord around bracket. Disconnect power cord from bottom of ride control stand. Store control stand at pivot position of streetside outrigger.
 - g. Hang Cliff Hanger sign on streetside outboard sweep.

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CLEANING OF SAIL AND SWEEP PANEL FABRIC

A. Dirt Removal

1. Use powdered or liquid laundry detergent to remove dirt. Rub soiled area with detergent.
2. Rinse with water.

B. Grease Removal

1. Grease can be removed with solvents, such as gasoline, acetone, MEK.
2. Put a towel underneath the sail or panel where there is grease. Rub the fabric with a rag soaked in the solvent.
3. Immediately rinse with water.
4. Wash with laundry detergent and water.

RECOMMENDED LUBRICANTS

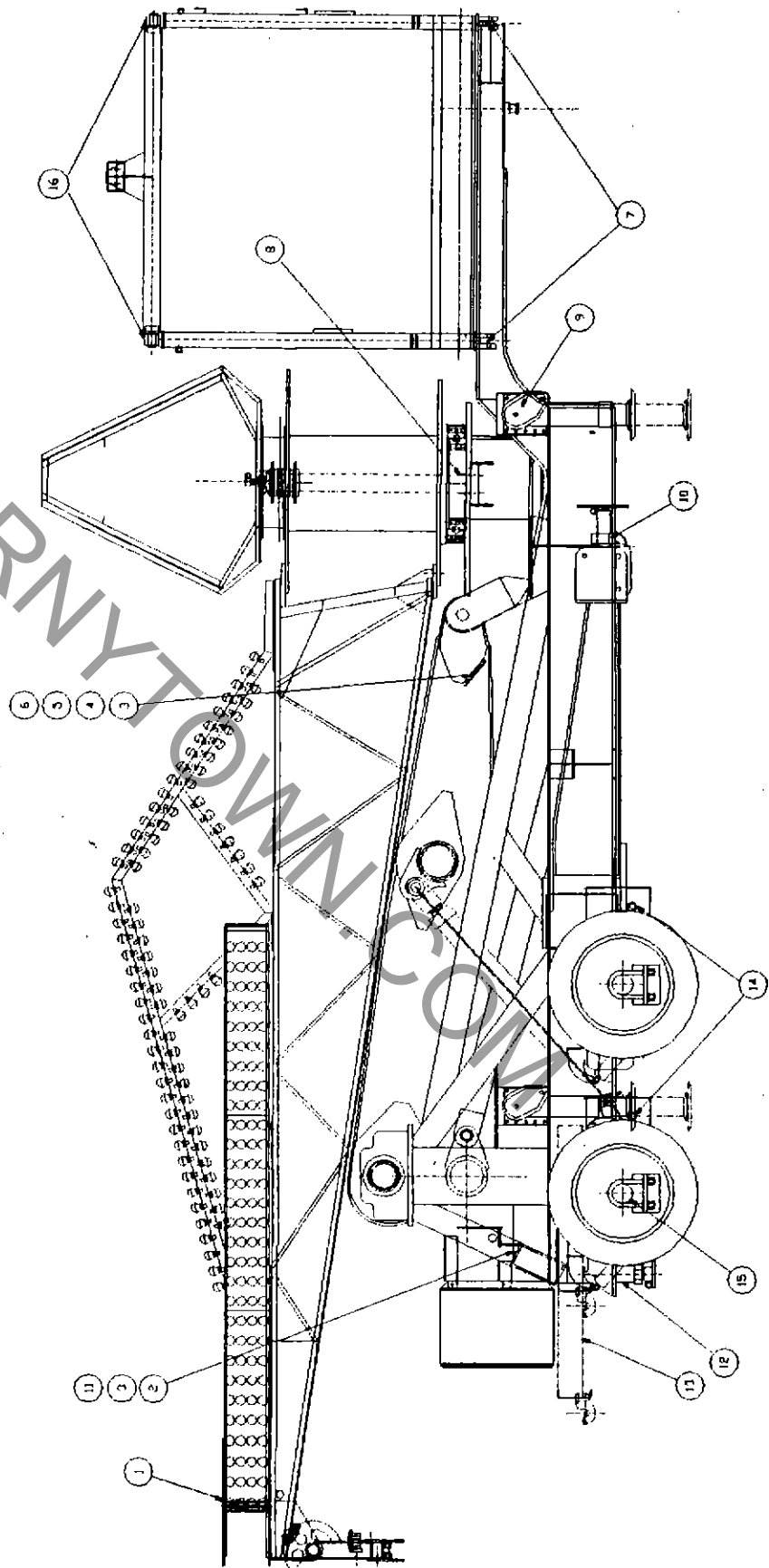
| BRAND | GREASE | PINION GREASE | HYDRAULIC OIL | GEAR OIL |
|-----------------------|-----------------------|--------------------------|--------------------------|-------------------------|
| Chevron | Ultra Duty EP 2 | Open Gear Lubricant | 150 46 | RPM Universal 80W90 |
| Texaco | Starplex 2 | Texclad 2 | Rando Oil HD 46 | Multigear 80W90 |
| Mobil | SCH 460 | N/A | DTE 15M | Mobil Lube. HD 80W90 |
| Pennzoil | Pennlith Ultra | N/A | Pennzbell AW 46 | #4092 80W90 |
| B.P. | N/A | N/A | HLP HD 46 | Transgear 80W90 |
| Valvoline | N/A | N/A | 043 | #838 80W90 |
| Amsoil (Synthetic) | Multi- Purpose GLC | N/A | AHO 15046 | AGR 80W90 |

N/A = Not Available

LUBRICATION MAINTENANCE SCHEDULE

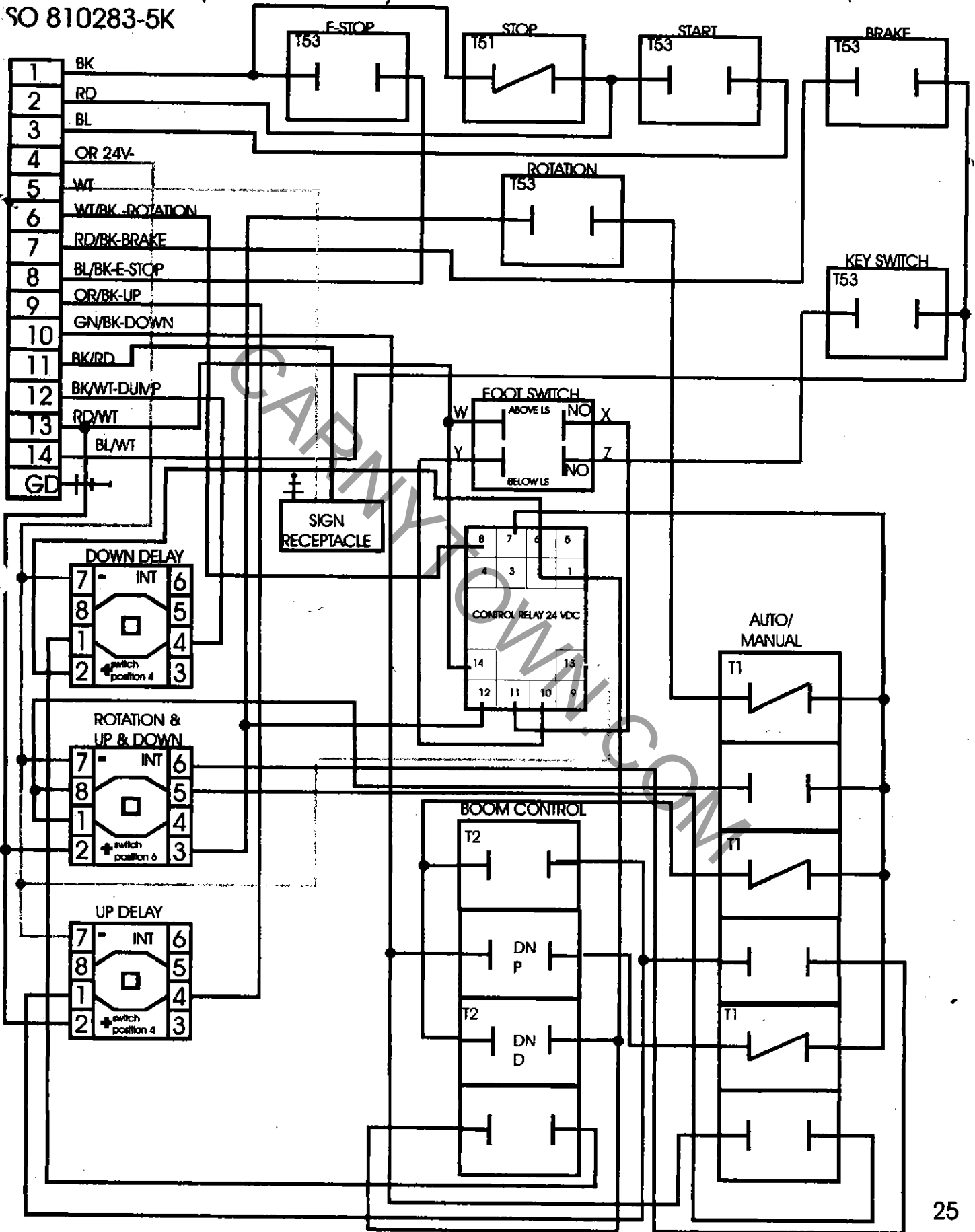
| <u>FIG.#</u> | <u>ITEM</u> | <u>TYPE OF LUBRICANT</u> | <u>FREQUENCY</u> |
|--------------|--|--------------------------|------------------|
| 1 | Bow pivot pin | Grease | Every 3 months |
| 2 | Boom pillow block bearings | Grease | Daily |
| 3 | Link arm ends | Grease | Daily |
| 4 | Upper cylinder pin | Grease | Daily |
| 5 | Boom platform pivot pin | Grease | Daily |
| 6 | Avon center hub bearings | Grease | Daily |
| 7 | Passenger carrier boom bearings (2 each) | Grease | Monthly |
| 8 | Pinion gears | Pinion Grease | Monthly |
| 9 | Landing gear (3 each) | Grease | Monthly |
| 10 | Outrigger screw jack threads | Grease | Monthly |
| 11 | Lower cylinder pins | Grease | Daily |
| 12 | Rear screw jack threads | Grease | Monthly |
| 13 | Sliding rear bumper | Grease | Monthly |
| 14 | Rear landing gear | Grease | Monthly |
| 15 | U joints | Grease | Monthly |
| 16 | Car rack pillow block bearings | Grease | Monthly |

CLIFFHANGER LUBRICATION DRAWING



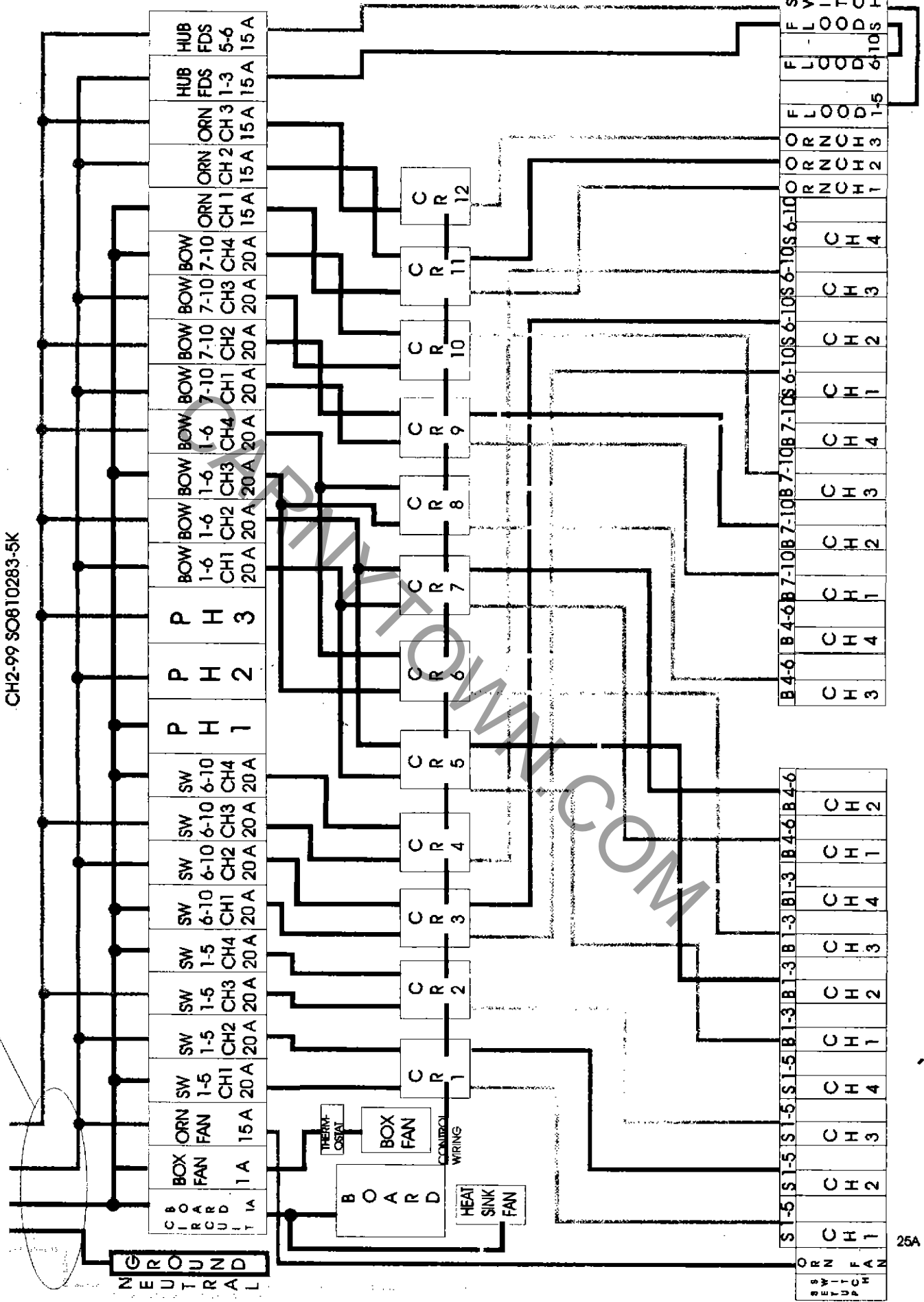
MANIFOLD BLOCKS ARE LOCATED ON CURBSIDE OF BODY AND REAR OF TRAILER

CLIFF HANGER CONTROL BOX
 1\12\99 CH2 99 (CH2-99E1.CDR)
 SO 810283-5K



2AWG 5 CONDUCTOR
FROM COMMUTATOR

CLIFF HANGER LIGHT
CONTROL BOX 1/12/99
CH2-99 SO810283-5K



NEUTRAL
GROUND

| | | | | |
|-----|------|-----|-----|-----|
| SW | 1-5 | CH1 | 20A | 20A |
| SW | 1-5 | CH2 | 20A | 20A |
| SW | 1-5 | CH3 | 20A | 20A |
| SW | 1-5 | CH4 | 20A | 20A |
| SW | 6-10 | CH1 | 20A | 20A |
| SW | 6-10 | CH2 | 20A | 20A |
| SW | 6-10 | CH3 | 20A | 20A |
| SW | 6-10 | CH4 | 20A | 20A |
| PH | 1 | | | |
| PH | 2 | | | |
| PH | 3 | | | |
| BOW | 1-6 | CH1 | 20A | 20A |
| BOW | 1-6 | CH2 | 20A | 20A |
| BOW | 1-6 | CH3 | 20A | 20A |
| BOW | 1-6 | CH4 | 20A | 20A |
| BOW | 7-10 | CH1 | 20A | 20A |
| BOW | 7-10 | CH2 | 20A | 20A |
| BOW | 7-10 | CH3 | 20A | 20A |
| BOW | 7-10 | CH4 | 20A | 20A |
| ORN | CH1 | 15A | 15A | 15A |
| ORN | CH2 | 15A | 15A | 15A |
| ORN | CH3 | 15A | 15A | 15A |
| ORN | CH4 | 15A | 15A | 15A |
| HUB | FDS | 1-3 | 15A | 15A |
| HUB | FDS | 5-6 | 15A | 15A |

CR 1

CR 2

CR 3

CR 4

CR 5

CR 6

CR 7

CR 8

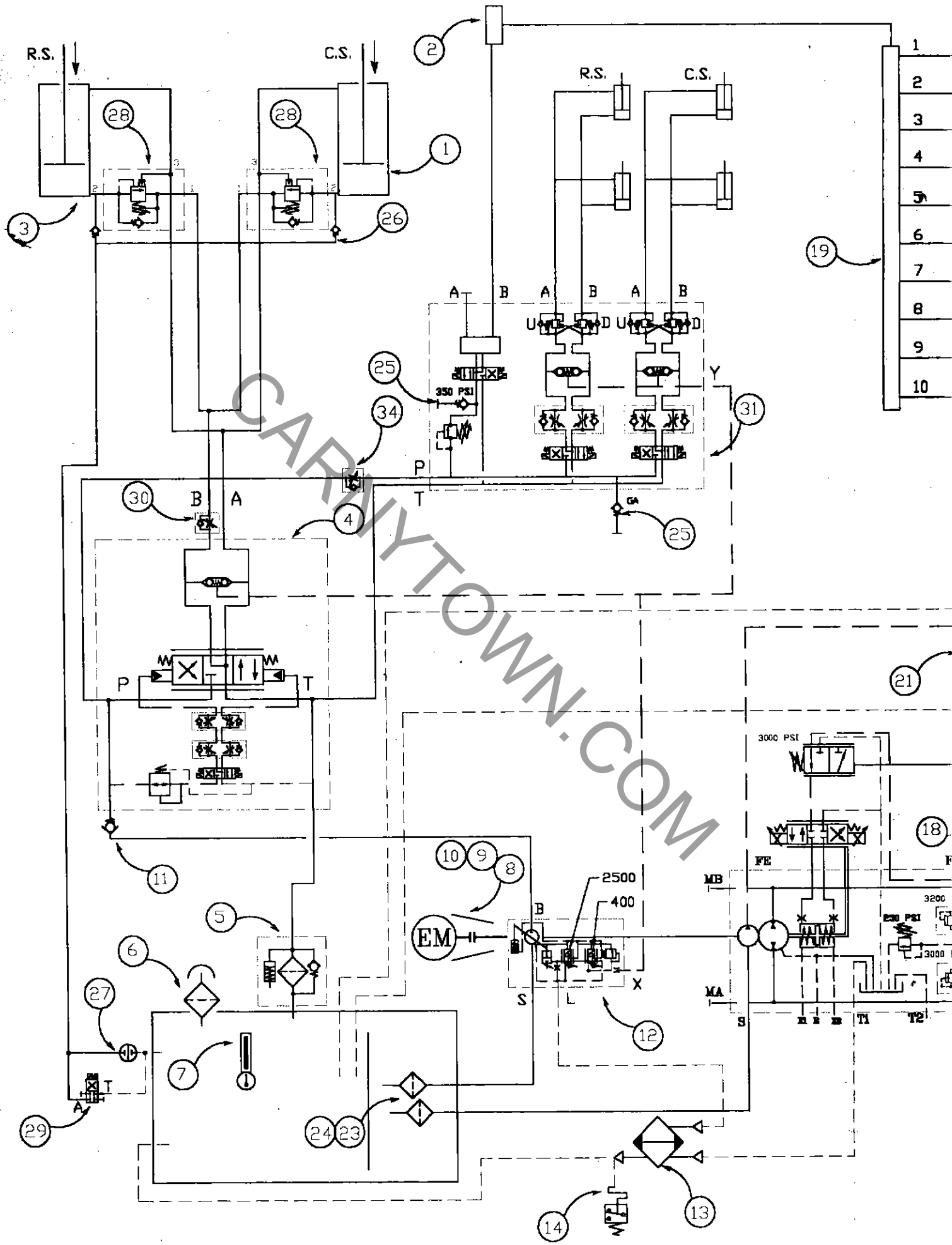
CR 9

CR 10

CR 11

CR 12

| | | | | |
|-----|------|-----|-----|-----|
| SW | 1-5 | CH1 | 20A | 20A |
| SW | 1-5 | CH2 | 20A | 20A |
| SW | 1-5 | CH3 | 20A | 20A |
| SW | 1-5 | CH4 | 20A | 20A |
| SW | 6-10 | CH1 | 20A | 20A |
| SW | 6-10 | CH2 | 20A | 20A |
| SW | 6-10 | CH3 | 20A | 20A |
| SW | 6-10 | CH4 | 20A | 20A |
| PH | 1 | | | |
| PH | 2 | | | |
| PH | 3 | | | |
| BOW | 1-6 | CH1 | 20A | 20A |
| BOW | 1-6 | CH2 | 20A | 20A |
| BOW | 1-6 | CH3 | 20A | 20A |
| BOW | 1-6 | CH4 | 20A | 20A |
| BOW | 7-10 | CH1 | 20A | 20A |
| BOW | 7-10 | CH2 | 20A | 20A |
| BOW | 7-10 | CH3 | 20A | 20A |
| BOW | 7-10 | CH4 | 20A | 20A |
| ORN | CH1 | 15A | 15A | 15A |
| ORN | CH2 | 15A | 15A | 15A |
| ORN | CH3 | 15A | 15A | 15A |
| ORN | CH4 | 15A | 15A | 15A |
| HUB | FDS | 1-3 | 15A | 15A |
| HUB | FDS | 5-6 | 15A | 15A |



- 1
- 2
- 3
- 4
- 5
- 6
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- 8
- 9
- 10

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| | | | | | |
|--------------------------|--|------------------------------------|--|--|--|
| DARTRON IND., INC. | | P.O. BOX 12114 SALLEN, OR 97309 | | USE AS REFERENCE TO THIS DRAWING AS SHOWN ON THE DRAWING | |
| TELEPHONE CATALOG NUMBER | | DRAWING NUMBER | | DATE | |
| CLIFFHANGER HYD. | | 089602 | | 1/1 | |
| SHEET | | 0 | | REV. NO. | |
| DATE | | 10-12-98 | | BY | |
| DRAWN BY | | 1-1 | | CHECKED BY | |
| SERIAL NO. 80893-8K | | 99-2 | | SERIAL NO. 80893-8K | |
| SERIAL NO. 81061-3K | | 99-1 | | SERIAL NO. 81061-3K | |
| SERIAL NO. 80712-1-3K | | 98-3 | | SERIAL NO. 80712-1-3K | |
| SERIAL NO. 80608-1-3K | | 98-2 | | SERIAL NO. 80608-1-3K | |
| SERIAL NO. 80127-1-3K | | 98-1 | | SERIAL NO. 80127-1-3K | |

- 34 INLINE FLOW CONTROL
- 33 ROTATION BRAKE VALVE
- 32 FRONT RACK CYLINDER QTY 4
- 31 AUXILIARY MANIFOLD
- 30 BOOM DOWN FLOW CONTROL
- 29 BOOM DUMP VALVE
- 28 COUNTER BALANCE MANIFOLD
- 27 HIGH PRESS. BALL VALVE
- 26 REXROTH CHECK VALVES
- 25 SCHROEDER TEST PORTS
- 24 SUCTION STRAINER
- 23 SUCTION STRAINER
- 22 CHARLYN MOTORS QTY 2
- 21 SCHROEDER PRESS. FILTER
- 20 DISK BRAKE CALIPERS QTY 20
- 19 DISTRIBUTION MANIFOLD DARTRON
- 18 REXROTH CHECK VALVE
- 17 SCHROEDER PRESS. FILTER
- 16 FREE WHEEL VALVE
- 15 REXROTH HYDROSTATIC PUMP
- 14 PDI TEMP SWITCH
- 13 THER. TRAN. HEAT EXCHANGER
- 12 REXROTH PRESS. COMP. PUMP
- 11 REXROTH CHECK VALVE
- 10 HAYES COUPLING
- 9 C-FACE FLANGE ADAPTER
- 8 50HP. ELECTRIC MOTOR
- 7 SIGHT GAUGE
- 6 FILTER BREATHER
- 5 RETURN FILTER
- 4 DIRECTIONAL VALVE
- 3 LOAD SENSE SWITCH
- 2 PIPOT PRESSURE RELIEF
- 1 BOOM LIFT
- 2 DISTRIBUTION VALVE
- 3 HYDRAULIC CYLINDER (LEFT)
- 4 BOOM LIFT
- 5 DISTRIBUTION VALVE
- 6 HYDRAULIC CYLINDER (RIGHT)

