OPERATION AND MAINTENANCE MANUAL

MFG: MULLIGAN ENTERPRISES
NAME: SEA RAY
TYPE: NON-KIDDIE

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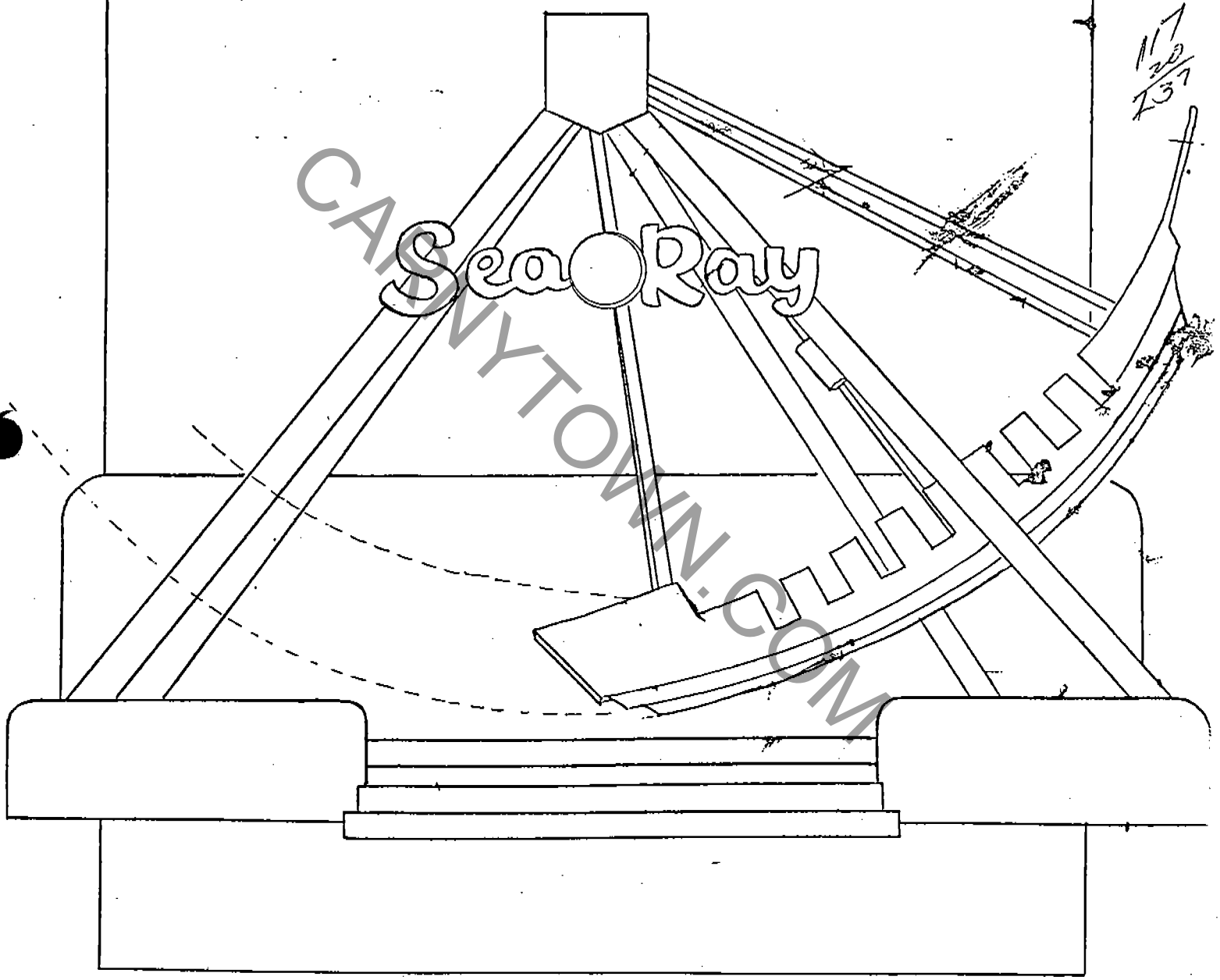


TAMPA AMUSEMENT DEVICES INC.

SET UP

Once the trailer's have been put on location as per figure 1 leveling and Set Up can begin.

"NOTE" The scenery must be opened before setting up the ride as the side flap's will not open once the tower's have been spread and raised.

Open front and back flap's on Van and install bottom wind brace's. Raise top flap and install wind brace's.

If Van is equiped with corner scenery flap's they should be opened at this time and all wind brace's installed.

Connect center load trailer to a power source capable of supplying 100kw. of three phase power. Turn on main breaker in electric panel.

"NOTE" Do not start Drive Motor at this time! Check for correct phasing by set up motor only. If drive motor run's in reverse for a short period of time damage to dynapower could result.

Place blocking and pads under four hydraulic cylinder's used to level ride.

Remove pin's and pull four stabilizing arms from trailer and repin in the out position.

Place blocking and stabilizing jack's by each of these four arm's. (They probably will not fit under these arm's until trailer has been raised.)

Start set up pump and 1 cylinder at a time. Lower into stand until trailer raises about one inch (Be sure cylinder sit's in pocket at top of stand).

Using two cylinder's at a time working Front and Back as pairs, raise trailer keeping as level as possible until tires are off the ground.

Place blocking and stabilizing jacks under stabilizer arm's and raise until snug (Be sure Jack sit's in pocket under stabilizer arm).

Taking 1 of the four side's of the trailer at a time level trailer as each side is complete the stabilizer jack should be tightened and cylinder's retracted to at least 2" inches above stand.

Remove pin's and unfold lower half of tower and bolt with 3 nut's and bolt's.

"NOTE" Use of a rope is recommended to prevent lower tower from slamming tower flange.

Unpin and lower rear tower lower support (no winch is required) and pin the two half's.

Before proceeding check that the four tower stabilizer arm's are snug to tower support arm's.

When raising tower's it is very important that they stay parallel to each other. To do this it is necessary to place some one at the front or back of trailer to help keep them in line.

Raise front tower's first. Start pump and raise tower's. Raise tower's being careful as not to have lower end of tower strike lower tower support arm's.As you reach the top tower's should raise close to end of cylinder stroke.

Go to back of trailer and attach winch to sweep's. Take tension winch but do not attempt to raise sweep's. They will follow track. Keep cable moving with sweep's as tower's are raised. Raise rear tower's the same as front watching lower tower support arm's. Be sure as tower's go up they do not strike front tower support brace's. Raise back tower's to a point higher than front.

To connect tower's lower front tower's and rear tower's until cone on top of front tower's line up with pocket on back tower. When tower's are joined remove pressure from tower cylinder's. Install bolt's and nut's in top tower flange's.

Remove front tower support brace's and fold and pin to tower's.

To install scenery and platform's proceed as follows.

Tower light's
Top sign
Sea Ray sign
Front boat platform
Front step's
Front scenery
Front fence
Control Box
Rear platform's
Rear exit ramp's
Rear fence
Front boat light's
Rear boat scenery
Pirate
All assorted hardware

Start pump and slowly rock boat so as to check platform clearence and that boat run's even on drive tire.

Use winch and lower sweep's to center position. Remove sweep winch bracket. Separate sweep's and install in rear sweep only. Use winch to pull rear sweep past sweep ears on back of boat.

Remove pin's from front trim on boat and raise to the upper position. Raise front of boat trim and install mast. Remove axle transportation supports.

Manually swing front sweep to a point past ears on front of boat. While holding sweep in this position raise boat trying to keep level until sweep's can be pinned in front sweep ear's.

Go to back of boat and use winch and hydraulic's to pin back of boat.

Raise and pin lower tower support arm's. Install pad's and blocking so as to require the least amount of adjustment of the jack as possible. Do not apply pressure to these pad's at this time.

Install lower tower support arm cross brace and trailer center brace. Install support arm thruss rod's snug do not tighten at this time.

Tighten lower tower support arm jack's/ Do this while watching to see that keel of boat ride's in center of trailer. Do not over tighten an adjustment to the point of approximately ½" above tower arm support brace is normally enough. Do not readjust jack's on tower arm support brace's. They should not touch tower arm at this point. During normal operation they do not serve as support and should not be taken from there level position.

Go back and tighten all thrust rod's, nut's, and bolt's and turn buckles at this time. Plug boat to sweep wire in at rear sweep pin. Remove front boat trim bracket and store in fifth wheel pocket. Install drive tire's and raise micro-switches.

"NOTE" When trailer is level the four cylinder's should be free of all stand's and not supporting any weight.

Disconnect Hydraulic hose's from leveling cylinder's and attach to Boat set up cylinder's at this time.

Install four tower stabilizer arms at this time and level.

Remove all the braces used on the front of trailer for transportation and store in fifth wheel pocket.

Be sure all bracket's and pins are removed and unfold both front tower's until gate's are fully extended and pinned.

Install tower support brace's to form X between both front tower's.

Remove pins and unfold lower half of tower and bolt placing 3 bolt's and nut's in each tower.

"NOTE" Use of a rope to prevent lower half of tower from slamming tower flange is recommended.

Lower front tower lower support arm's using winch provided and pin in the middle.

Using set up pump raise front tower's until they are approximately 2feet off rear tower transportation bracket's being careful to keep both tower's parallel to each other.

Remove transportation bracket's from end of tower's and place on ground under trailer.

Remove transportation brace's from rear tower's including sweep support turn buckles.

Unfold back sweep's until gates are fully extended. It is important to watch that sweep's do not move out of track, should it start to move simply go to opposit tower until it becomes centered again.

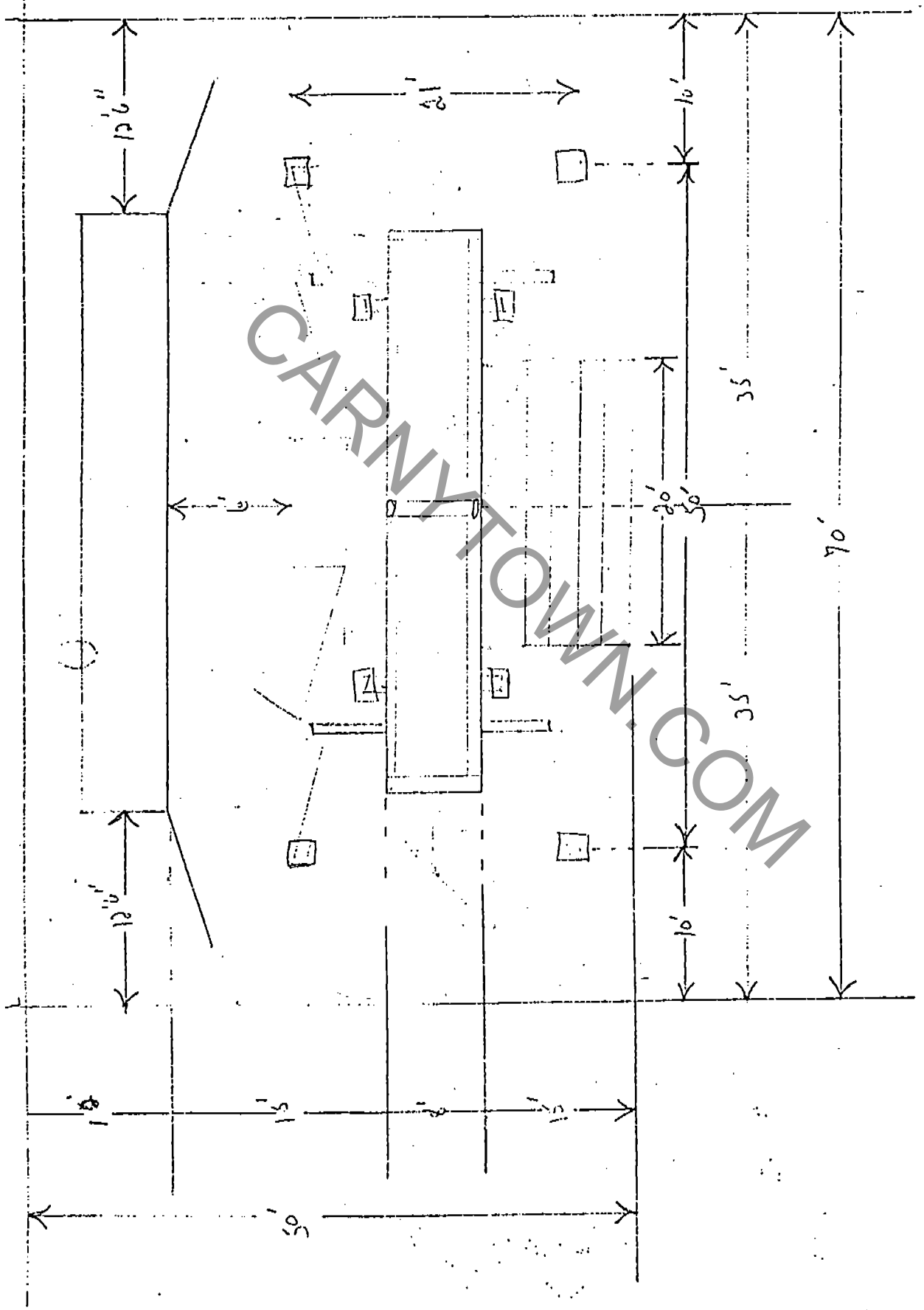
Install 3 bolt's and nut's in tower flange at the axle.

INTRODUCTION

The amusement ride known as the "SEA RAY" is a portable ride mounted on two trailer's. It consists of Four Tower's which are connected at the bottom by one of the trailer's and at the top by an axle and a hub.

The Axle is attached to the Tub which is in the shape of a Old Boat by two sweep's. The Boat is fitted with eight seats allowing the seating of thirty-two Adults, four per seat, forty Children, five per seat, or any combination of both.

The Boat is powered by a fifty horse power electric motor which drive's a Hydraulic dynapower. The dynapower drive's two Hydraulic motor's which are attached to 7:50 X 16.5 tire's. The tire's Raise and Lower to the keel of the boat causing it to Rock back and forth until it come's to a Arch of Approx. 180 degrees.



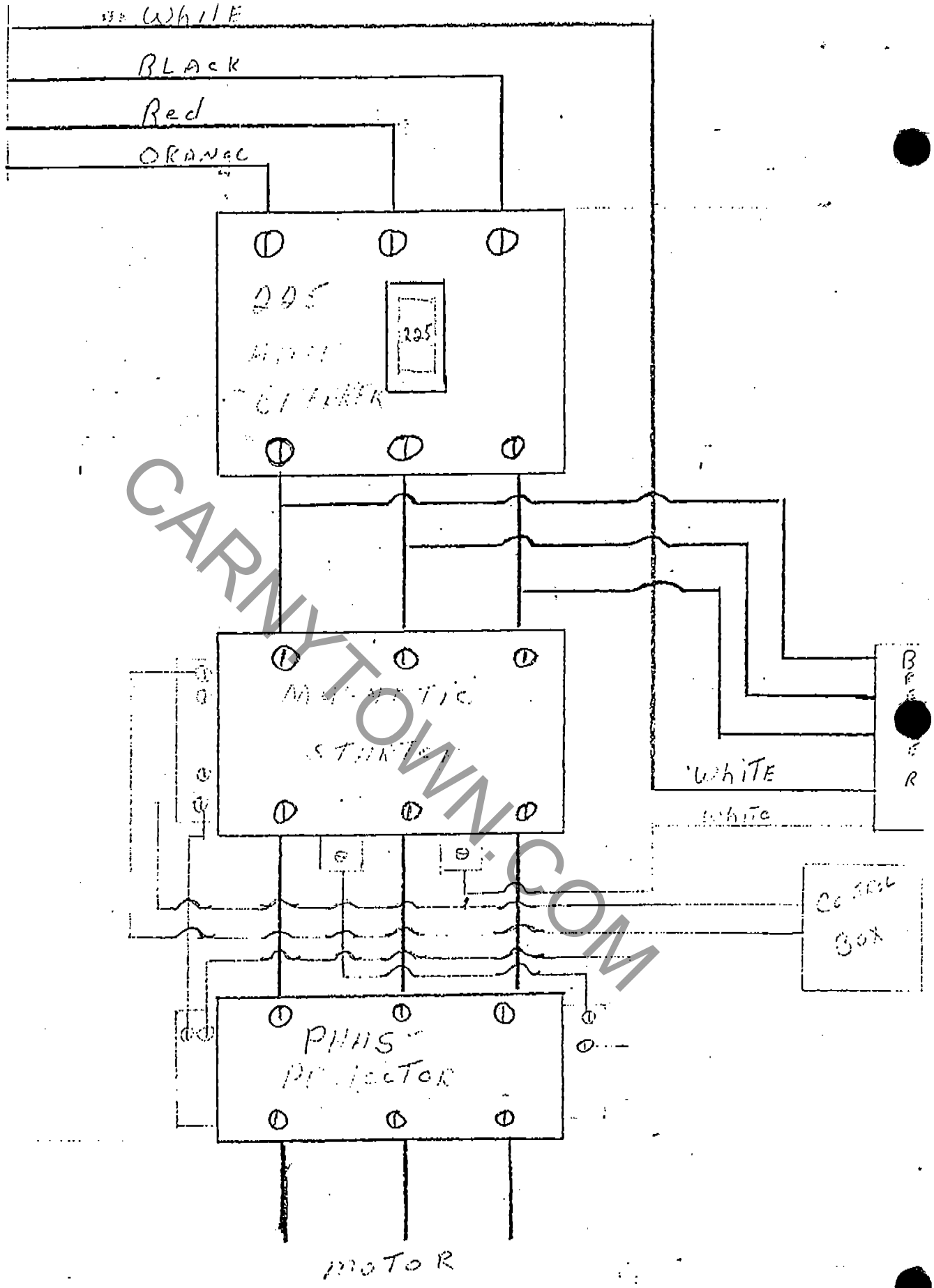
MAIN ELECTRICAL SYSTEM

The main electrical system consists of a five wire system with the green connected to the trailer frame.

It has a 225amp. three phase main breaker which controls all voltage to the ride. The power is then devided into two section's. The breaker panel which controls voltage to light's and control circuit's. This will be discussed later in this manual. The power also goes to a magnetic starter.

The magnetic starter is a NEMA size 3 and is coupled to a phase protector to prevent the motor from being damaged by the loss of 1 phase.

From the phase protector, the power goes directly to a 50 horse power motor which drive's the main hydraulic system.



DRIVE TIRE ELECTRICAL SYSTEM

The drive tire electrical system consists of 5 major component's.

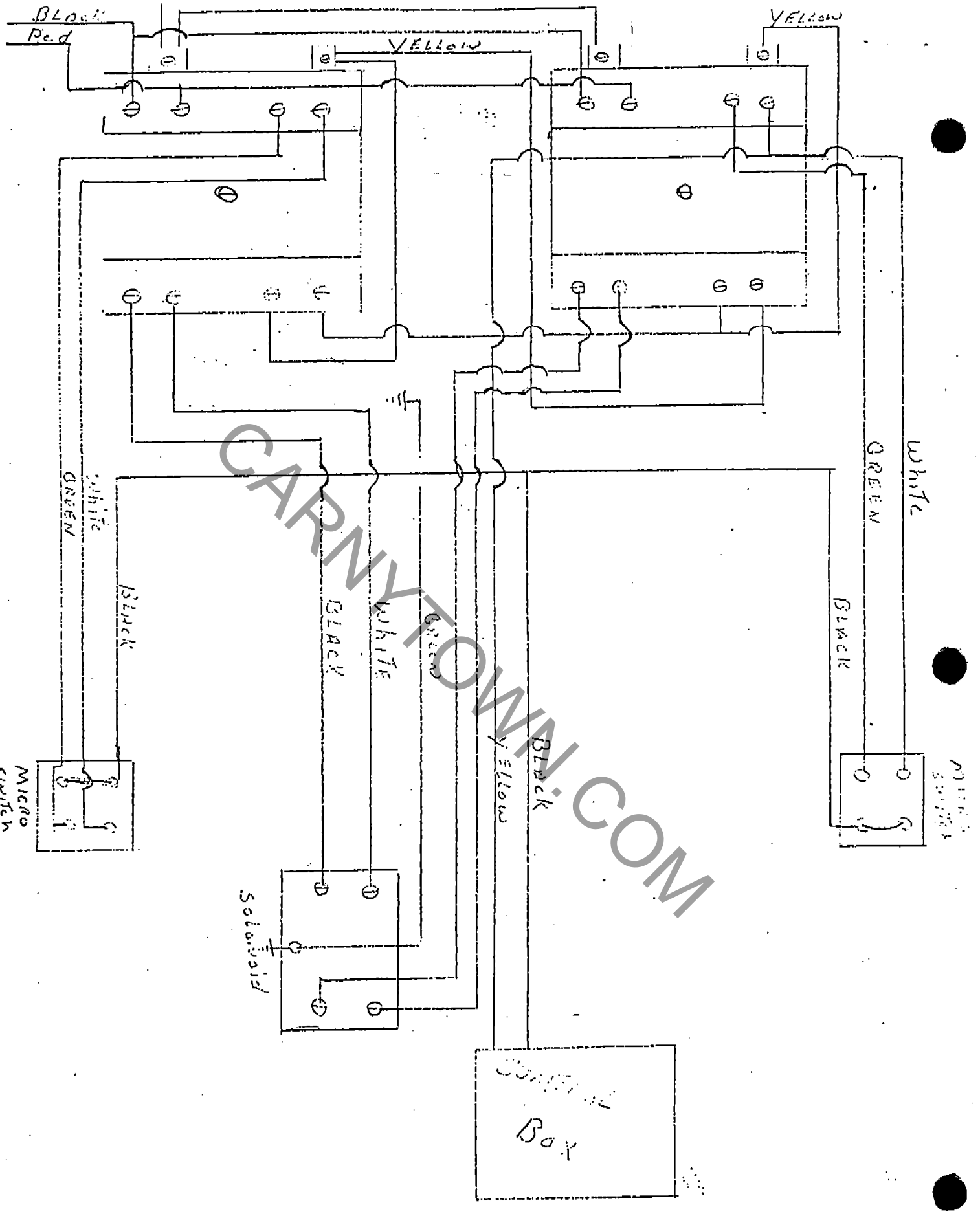
Two micro switches mounted, 1 on the back and 1 on the front of the trailer frame. They are activated by a wiper attached to the keel of the boat.

Two relay's mounted in the electric panel at the rear of the trailer.

One electric control solonoid mounted at rear of trailer by hydralic system.

When the boat is put in motion one of the drive tire's is brought up to the keel of the boat, causing the boat to move in one direction. When the wiper mounted on the keel strikes the micro switch it cause's the following sequence to take place.

The micro switch cause's one of the relay's to denergize dropping the tire. The other relay energizes activating the electric control solonoid, thus raising the opposite tire. This tire pushe's the boat in the opposite direction until the wiper strike's the opposite micro switch, thus switching the tire's again.



MAIN DRIVE HYDRAULIC SYSTEM

The main drive hydraulic system consists of a General Signal Dynapower which is driven by a 50hp. electric motor. For information concerning the care and operation of the dynapower refer to Service manual in back of book.

The fluid from the dynapower is sent through a pressure regulator to two Char-Lynn 10,000 series motor's. These motor's run in opposit direction's. The one to the rear of the trailer turning clockwise, the one to the front of the trailer turning counter clockwise.

The fluid is then returned to the dynapower by way of a solonoid controlled pressure regulator which act's as the breaking system. When the break is applied this regulator restricts the flow of fluid, thus causing pressure to be applied to the outlet of the Char-Lynn motor.

With the dynapower controlling the speed of the fluid it controls the rotation of the drive tire's. With the drive tire's speed controlled we are able to control the speed of the boat, which keeps the boat at a constant height at any variation of pressure. Once the keel of the boat and the drive tire rotation is at the same speed no further pressure will be applied causing the boat to remain at the pre-set level.

The fluid is piped from the dynapower through a discharge tube to a filter system and into a cooling system. From there it is pumped back into the tank, there is a charge pump bolted to the end of the dynapower which pump's oil from the tank into the dynapower keeping it full of oil at all time's. It is because of this pump that we are allowed to leave the dynapower sit idle for long periods of time with out damage due to heat.

SEE FIGURE 4 and FIGURE 5 ITEM B

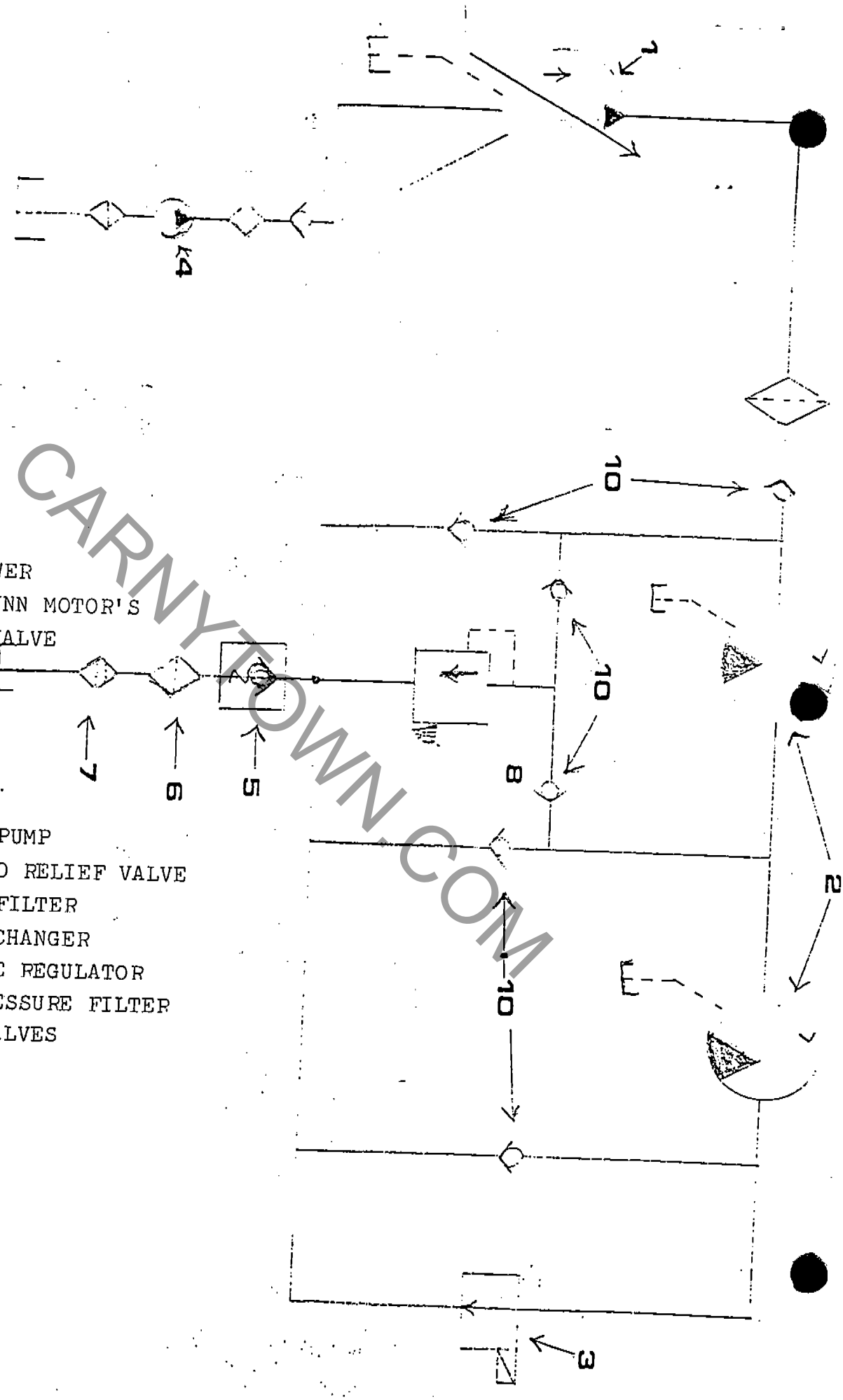


FIG 4

1. DYNAPOWER
2. CHAR-LYNN MOTOR'S
3. BRAKE VALVE
4. CHARGE PUMP
5. FULL FLO RELIEF VALVE
6. RETURN FILTER
7. HEAT EXCHANGER
8. PRESSURE REGULATOR
9. HIGH PRESSURE FILTER
10. CHECK VALVES

OPERATION

The SEA RAY was designed and manufactured with adequate factors of safety to the following specifications:

Average seat load	600 lbs.
Max seat load	750 lbs.
Max Total load	4,800 lbs.

In the interest of safety, it is recommended that the ride not be operated when wind's are in excess of 40 miles, or when wind's cause a side movement of keel in excess of 2".

NOTE: Stress Analysis is available on request.

DAILY OPERATION

Before starting; pump operator should check the followins:

All pin's and R key's

All turn buckles and adjustment rod's for proper tension

All nut's and bolt's in tower both top and bottom

Hydraulic level in tank (about 3/4 full)

NOTE: Ride is powered by a dynapower. A lack of hydraulic fluid will damage it in a very short time. Do not operate when oil level is below 1/2 in tank.

Bolt's between Electric motor and all pump's in system

Lap bar's for proper tightness. (Lap bar should move upward about 1" when locked in down position)

Turn on Main breaker

Turn on all other breaker's; Air compressor should start at this time

Go to control box and start pump; At this time check for hydraulic leak's

With tire's down slowly move control lever and Rotate tire's. This should be done for about 3 to 5 minutes so as to heat oil, dynapower, and drive motor's

Stop tire's and raise tire to keel slowly rock boat so as to move boat high enough so it will leave tire's

While boat is rocking walk around trailer and check tower jack stand's for tightness and movement

Again check for hydraulic leak's

Stop boat check Lap bar operation

Run boat to high point of swing and check tower jack stand's for movement

Be sure all turnbuckles and adjustment rod's are tight

When loading we recommend you attempt to balance load as much as possible, starting in the back of the boat.

This ride is not designed to accomm odate small children in the very back or front seat's whether accompanied by a parent or not.

We strongly recommend smaller children be made to sit in middle seat's only and then only if they are at least 42" Tall.

EVERY 6 MONTH'S: All Zert fitting's on tower gate's
A few drop's of oil on all pin's with cotter key's

YEARLY: Drain all hydraulic oil and replace with
70 gallon's of No 13 AW46 hydraulic oil or it's equivalent

Remove and replace strainer and filter cartridge

The lubricant's noted above are recommended for Ambient tempertures from 20 degrees to 110 degree F.