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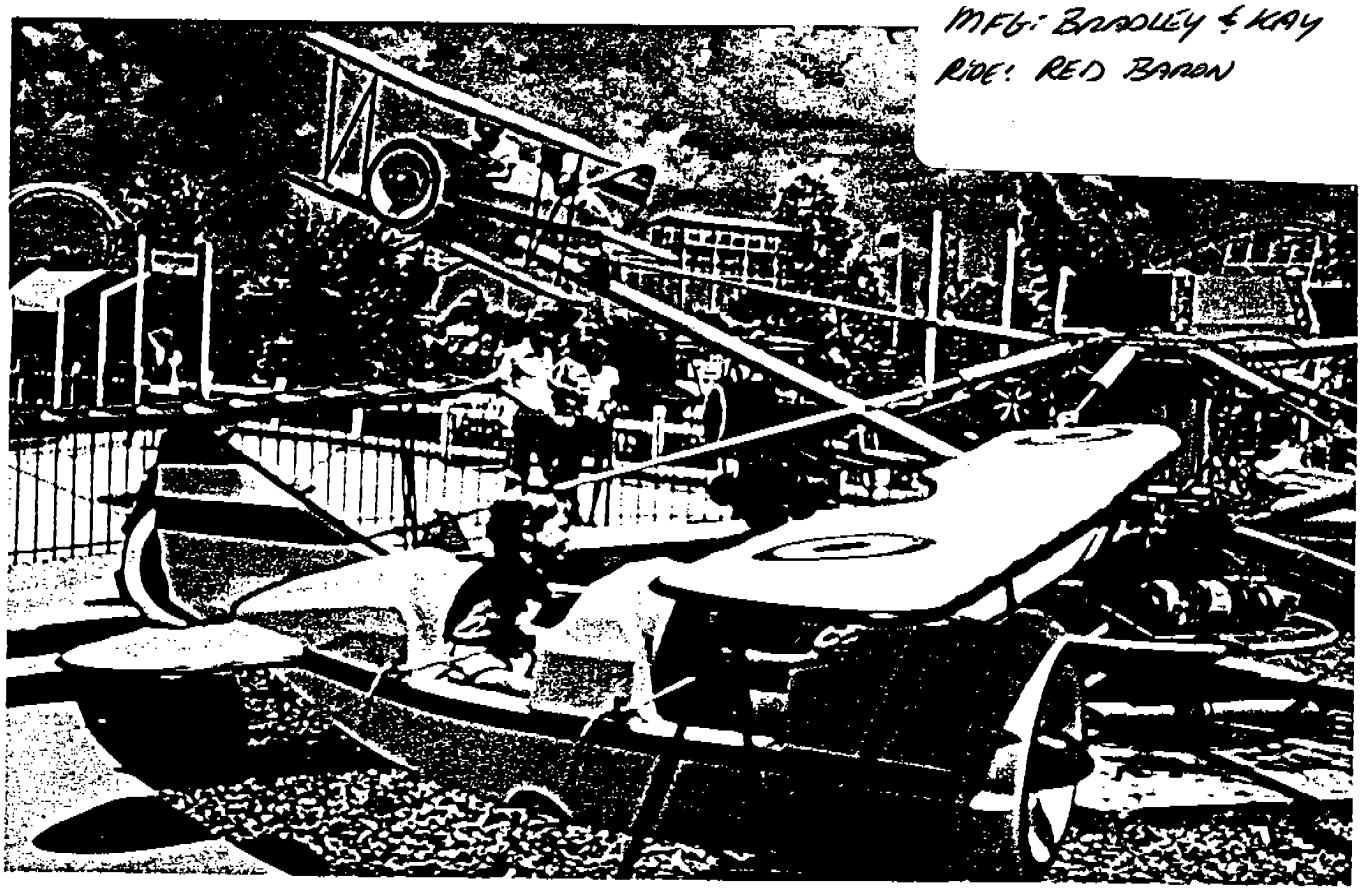

THE RED BARON

The "Red Baron" ride is the most popular children's ride created in many years. This uniquely designed ride gives children a chance to participate by flying their own plane.

Aircraft: 8
Seating: 16
Capacity: 320/hour
Overall ride diameter: 44'
Height in raised position: 15'
Diameter of plane path: 35'-2"
Motor and drive: 10 H.P., 208/220V, 60 cycle, 3-phase with fluid drive
Trailer mounting: Available
Accessories: — Center tower with skirt
— Center mounted plane with skirt
— Custom color schemes available.

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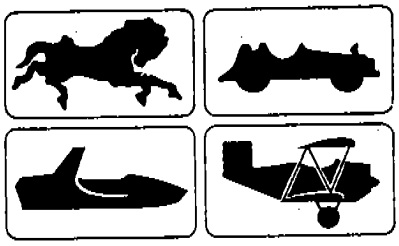

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This Manual is subject to forthcoming corrections and/or additions.

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USER'S MANUAL

The information in this document has been carefully checked and is believed to be entirely reliable. However, no responsibility is assumed for inaccuracies. Furthermore, Bradley & Kaye reserves the right to make changes to any products herein to improve reliability, function, or design. Often differences in the product from the information supplied in this manual may occur because we are continually upgrading the product and sometimes product improvement outpaces preparation of the manuals.

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Vibration occuring during transportation may cause fasteners, especially screw type to loosen.

All fasteners should be checked and tightened before putting this ride in operation.

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Be sure to fill all gear boxes with oil per specifications.

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RED BARON AIRPLANE RIDE

1. Description Of The Installation

The Red Baron Children's Ride consists of eight minature replicas of bi-wing airplanes each carrying two children passengers, all rotating about the ride center on independent sweep arms. Each sweep arm is hydraulically operated through a vertical motion by the vehicle passengers to simulate the up and down motion of actual airplanes in flight. The drive mechanism is operated by electrically driven hydarulics.

2. Technical Data

Ground space required	44 foot diameter circle
Number of vehicles	8
Passengers per vehicle	2
Capacity	320 per hour
Diameter of vehicle pad	35 feet 2 inches
Maximum height (vehicle in raised position)	15 feet
Overall ride diameter	44 feet
Motor and drive	10 HP plus 2 HP electric motors with hydraulic fluid drive

3. General Directions

1. The specifications and directions required for operating and maintaining this equipment have to be carried out in a responsible manner and adhered to by the owners/operators.
2. The manufacturer of the equipment is not liable for damage occuring:
   A. Where the directives and specifications are neglected.
   B. In the case of any change (of a mechanical, electrical or hydraulic nature) made to the equipment.
3. For the conscientious adherence to the specifications and instructions

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listed below, the management of the owner/operator concern has to designate one (or several) professionally qualified "responsible person", who adheres to, or controls and follows these specifications and instructions.

4. Generally technical supervision during maintenance is not required in detail. It is, however, a necessity for proper installation and as a contribution to it's safety.
5. Before every operational starting, the equipment should be examined to assure that all pins and bolts are in place and secure and that there are no hydraulic fluid leaks.
6. Defects occuring during operation have to be eliminated without delay. The operation has to be stopped for the time it takes to eliminate such defects.
7. The barriers necessary for the safety of people have to be completely and carefully mounted in accordance with local safety regulations.
8. During operation, the operating personnel shall exercise good judgement and shall adhere to safe practices regarding assisting the passengers and starting the vehicles.
9. In case of necessary work on the equipment, the electrical supply must be switched off.
10. The safety keys necessary to operate the ride are to be in the custody of a responsible person.
11. The electrical contractor responsible for the installation of the equipment shall comply with local regulations.

4. Description Of The Safety Equipment

1. Passenger Safety - Each passenger is fitted with a seat belt that is put in place and secured by the ride operator. The seat belt grip is outside the passenger compartment and generally inaccessable to the passenger.
2. Mechanical Safety - Ride design is such that on loss of power the ride

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gently stops and the sweep arms lower to rest at the unloading position.

5. Instructions For Installation

Set the ride center on the foundation and secure in place with anchor bolts or with expansion bolts.

Attach booms to Red Baron Center as shown in drawing D-743.

Lubricate ride per instructions D-743.

Note: Main column bearings oiled with 50 weight oil in reverse chamfers. Keep lubricated.

Attach fuselages to booms and assemble wings as shown in drawing C-143.

Run cable from cam on passenger control mechanism (C-143) to cable clamp on extension on control valve arm on turret. Run cable under extention of pivot pin.

Adjust tension so that when control stick in plane is in full back position the valve control arm is full forward. Secure cable at control arm with cable clamp. (A-987) A998

Electrical connections shall be made by qualified electricians.

Connect control panel to power and to ride. Leads to ride connect at base of tower. Adjust timer to desired ride duration.

Start button starts rotation motor. After a short delay, motor on hydraulic pump runs and then the solenoid valve on the tower closes. At the end of the cycle, all circuits shut off. Stop button must be raised to operate the ride. At any time the ride can be totally shut down and stopped by depressing the stop button.

To put ride into operation:

Oil all fittings

Fill reservoir to top of guage with number 20 hydraulic oil

Fill case drain by removing red cap on tee on top of pump.

Fill tube with number 20 hydraulic oil.

Check motor rotation. DO NOT RUN PUMP BACKWARDS.

Adjust hydraulic pressure for plane to rise to full height in 11-15 seconds.

It should not exceed 1000 P.S.I.

All moving points are greased or oiled according to the lubrication schedule.

The main electrical power control panel is to be located at a suitable location; if possible under a shelter protected from the weather for convenience of maintenance.

Adjustment of rotation - The fluid clutch is to be filled with the proper amount of oil according to manufacturers recommendations and manuals.

After this has been done, the unit must be turned on and observed to see if a gentle starting takes place. If the starting is too abrupt or too violent, then oil is to be removed in very small increments until the proper starting is achieved. If the unit starts too slow, then small amounts of oil have to be added. The drive tire should never slip. After completion, all seal plugs are to be tightened securely, unit wiped free of all oil and checked for leaks.

Load Test - The gondolas shall be loaded with weights 200% of the rated load in each gondola (200 pounds). Then the unit is to be operated through it's normal cycle. Both the hydraulic pump motor and the rotation motor are to be checked with a suitable ampere meter during all phases of startup, running and slowdown and the current is to be noted and recorded in the operators log book. These currents must not exceed the name plate rating of the motors. The operating timer shall be set for the desired operating time and the unit run through several normal run cycles. All parts shall be visually inspected for proper functioning. If everything appears in order, all points have been lubricated and the currents do not exceed the rated value, then the unit should be run for several hours with the load and measurements and observations repeated. Everything in proper order, the unit is then ready for operation. The sweeps with the planes should be adjusted to take approximately twelve seconds to ascend all the

way to the top of stroke. Adjustment is pre-set at the factory.
All tests and adjustment work mentioned above must be carried out by a qualified technician. Whenever any part of the ride is energized or set in motion, all persons must be a safe distance from all moving parts. The qualified repair technician is responsible that these safety precautions are carried out. Deviation from the above procedures will void any and all warranty or liability claims.

6. Operating Instructions

The ride operator assists the children in boarding the airplane vehicles and secures them in place with the seat belt, latching it properly outside the passenger compartment.
With all passengers secured in place, the ride may be started by the operator by pressing the start button, at which time the ride rotation begins and the passengers may raise and lower the airplanes by using the control stick available to them. After a pre-set time, the ride stops rotating and the arms lower for the disembarking of the passengers. Operator should caution passengers to remain seated until ride has come to a complete stop. The ride operator releases the seat belts and assists the passengers off the ride. New passengers are brought into the area and the cycle begins again.

7. Maintenance

During any maintenance, repair or inspection work on any part of the installation, the power supply must be shut off and locked off reliably. Steps must be taken to prevent anyone from energizing any part of the equipment while work is carried out or personnel may be endangered.
Electric power may be reapplied only after the persons working on the ride have completed their task, are clear of moving parts, have re-instated the ride into a safe operating condition and have personally reported the ride clear and safe for energizing.
If testing with power is required involving moving parts, the following

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precautions must be observed:

A. The entire testing operation must be supervised and closely controlled by one qualified and responsible person being trained and familiar with the portion tested and it's possible behavior, side effects or dangers.

B. During live and moving tests the responsible person must be sure that everyone is out of range of the moving parts and that no one can enter this area unexpectedly.

C. All persons involved with such testing of equipment must be warned that danger may exist and that parts may move or unexpectedly may start moving.

The safety keys of the key switches must be kept by a responsible person.

For installation of the main power service, utmost care must be taken that all safety precautions are considered.

All work performed on any installation is to be ordered and supervised by the responsible person.

DAILY MAINTENANCE

A. Check level of oil at top of main center column bearing and keep filled with 50 weight oil.

B. Check air pressure in main drive tire and maintain at 40 P.S.I.

MONTHLY MAINTENANCE

A. Lightly oil all sweep pivots with 30 weight oil.

B. Apply grease gun to all nipples on the ride center drive mechanism including inboard sweep pivots.

C. Apply grease gun to all nipples on outboard end of sweeps.

D. Check gear box and replenish with 30 weight oil if necessary.

E. Check hydro-sheave and replenish with 10 weight hydraulic oil if necessary. See bulletin - Do not overfill.

F. Check level of oil in main tank and replenish with 20 weight

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hydraulic oil if necessary.

ANNUAL MAINTENANCE

A. Drain and refill gearbox with 30 weight oil (total 2 quarts).

B. Drain and refill hydro-sheave with 10 weight hydraulic oil.

C. Lightly grease both motors.

8. Foundation Data

Total ride weight including two passengers per vehicle at 160 pounds per passenger is approximately 7,800 pounds. Maximum foundation pressure on any one of the four pad footings is 3,200 pounds including eccentric passenger loading and allowance for impact. The foundation pads are located in accordance with drawing no. C-124.

9. Static Calculation of Structure

See attached calculations.

10. After one of operation, remove and back flush and clean suction strainer.

Repeate monthly during operation.

Replace filter annually.

Joseph Wm. Pendergast, B.C.E., P.E.
Consulting Engineer

STRUCTURAL ANALYSIS

for

"RED BARON" / "HANG GLIDER" RIDE

manufactured by

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Long Beach, CA 90813
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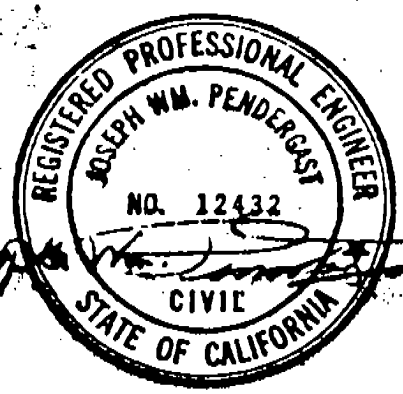

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CK. BY ... DATE ...

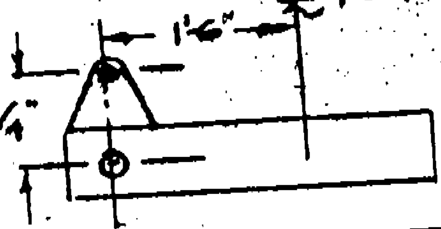
Ride Loads

Vehicle: 250# empty (max.)
Sweep: 100#
Passenger: 2 @ 160# = 320# (see sht. 2)
Impact: 235#

Max. loading = 250 + 100/2 + 320 + 235 = 855#

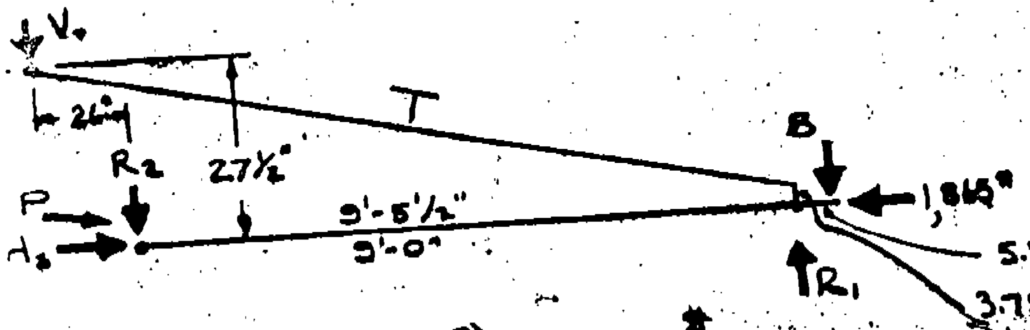
(Empty vehicle no impact = 250 + 100/2 = 300#)

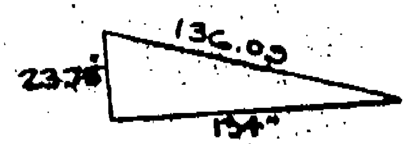
Sweep End (Vehicle Support)



Vertical reaction = 855# max.
Horizontal cable = $\frac{18}{8.25}$(855) = 1,865#

Sweep Loading





$R_1 = 855\left(\frac{113.5}{108}\right) = 899$#
$R_2 = 44$#
$V_T = 899$#
$H_T = \frac{134}{23.75}(899) = 5{,}072$#
$H_S = 5{,}072 + 1{,}865 = 6{,}937$#   P₁ Vector Sum ($R_2 + H_S$) = 6937#
$T = \frac{136.09}{23.75}(899) = 5{,}151$#

Stress Analysis:

Tension Rod: 1" φ Rod   Root area = 0.551 □"

Stress = 5,151 / 0.551 = 9,348 psi OK

1" φ pin in double shear: v = 5,151/2/.785 = 3281 #/in² OK

Spring constant: 6976 #/in

Impact load = 275/… (5151) = 1416 #

Compression = 1416/6976 = 0.203 ~1/4" OK (see page 3 impact analysis)

The pin: 0.752" φ (.444 in²)

Shear = 5,151/2/.444 = 5,801 #/in² OK

Bearing = 5,151/.75 × .752 = 9,133 #/in² < .9 F_y OK

Sweep:

Compression = 6,937 # /2 = 3,469 #

1.5" φ pins in 1/2" PL OK

1/4" welds @ .25 × .707 × 21 = 3,712 #/in OK

2×2×3/16" ф A = 1.2688 in²   F = 3,469/1.2688 = 2,734 psi

8' column: P = 3,469 #

l/r = 8×12/.7249 = 132.4

$F_a = 12\pi^2 E / 23(132.4)^2 = 2{,}712 \approx 2{,}734$ OK (Stabilized @ mid-point by 2×2 spreader)

Stabilizer Tie

Tension = 1,865 #

5/8" φ pins in DBL, 1/4" PL

v = 1,865/.307 = 6075 #/in² OK

1,865/.625×.25 = 11,936 #/in² < .9 F_y OK

2-3/16" φ Rods: f = 1,865/2×.068 = 13,713 < 20,000×1.33 OK

Center Support: (10" φ Sch. 40 pipe)

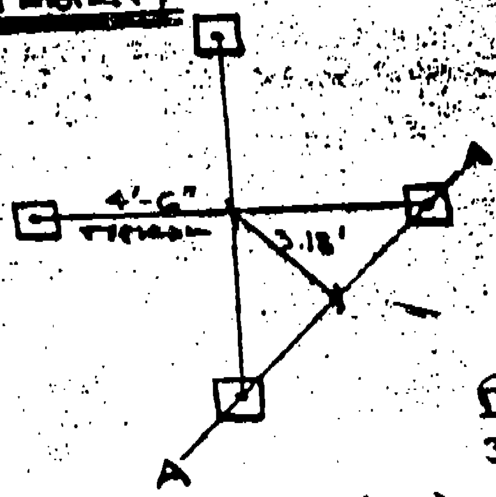
Use 3 vehicles full, 5 empty

P = 8(300) + 3(320+235) = 4,065 # + ~2,000 # ctr = 6,065 #

Bending = 855(13'-9") + 2(855)(9.72') − 300(13'-9") − 2(300)(9.72')
= 18,420 ft-#

$F = \frac{6065}{11.51} + \frac{18{,}420\,(12)}{29.90} = 7{,}902$ #/in²   OK

STABILITY



ΣM_{A-A} = [855(13.75' − 3.18') + 2(855)(3.72 − 2(300)(3.18') − 2(300)(3.72 + 3.18) − 300(13.75 + 3.18) − 2900(3.18)]

= [9037.35 + 11183.4 − 1908 − 7740 − 5079 − 8,904]

= − 3,410.25 (THEREFORE STABLE)

FOOTING PRESSURES:

3410.25 / 6.36 = 536# / 2 = 268 # PER PAD, MIN.

3(855) + 5(300) + 2800 − 536 = 6329# / 2 = 3165 PER PAD ON LINE A-A

24" Φ CONC. FTGS. OK

LEG BEAM:

f = 3,165 (54") / 11.058 = 15,456 psi. < 20,000 x 1.33 OK

IMPACT ANALYSIS:

RATE OF DESCENT IS LIMITED TO 7' IN 7 SECONDS BY CYLINDER VALVING.
COMPRESSION SPRING SHOULD CUSHION DESCENDING LOAD IN 1" VERTICAL DISTANCE. THEREFORE, TIME OF CUSHION = $\frac{1}{12} \times \frac{7 sec}{7'}$ = 1/12 SEC.

ACCELERATION = $\frac{V_1 - V_T}{t}$ = $\frac{1 \text{ FT/SEC} - 0}{1/12}$ = 12 FT/SEC²

F = ma = $\frac{(320 + 250 + 50)}{32}(12)$ = 232.5 # — CALL 235#

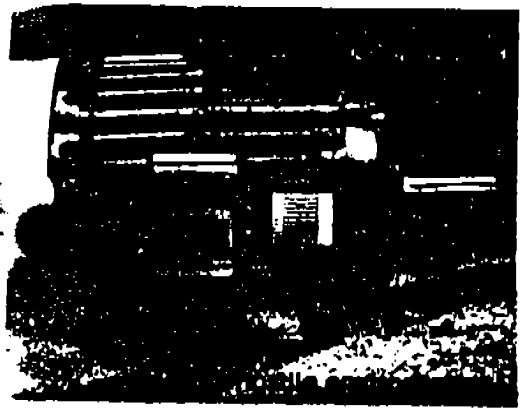
SPRING CONSTANT SHOULD BE:

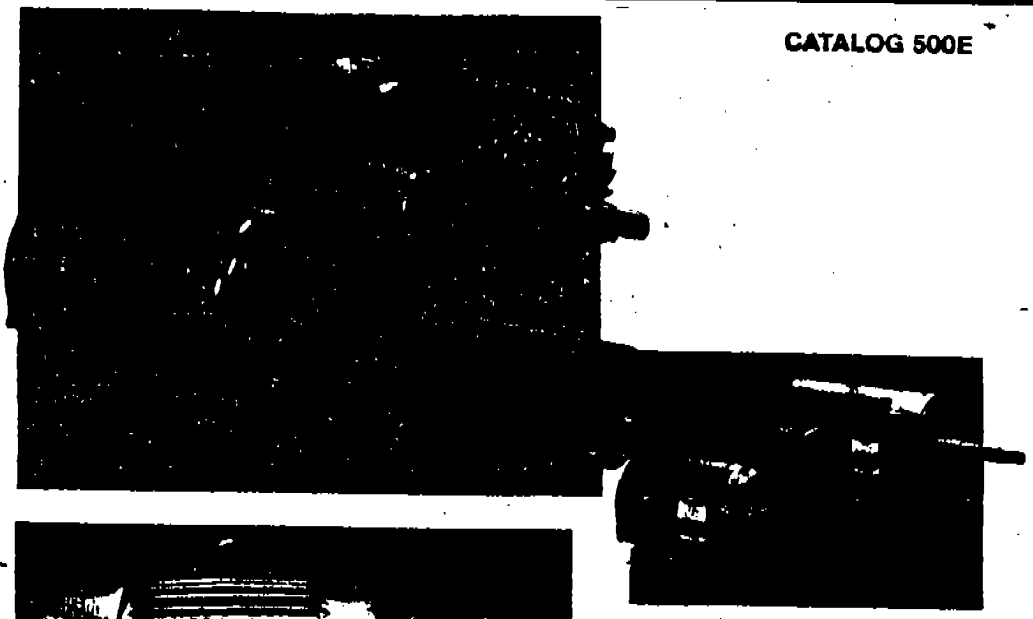
$\frac{136.05}{23.75}(232.5)$ = 1,332 # PER (136.27 − 136.09) INCHES .18"

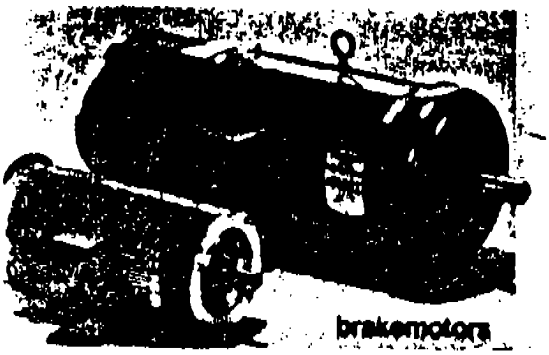
OR: 7,400 #/INCH.

6076 OK — (REDUCES IMPACT BY BEING MORE FLEXIBLE)

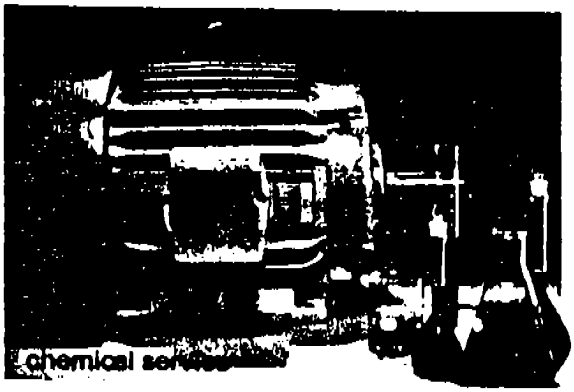
CATALOG 500E



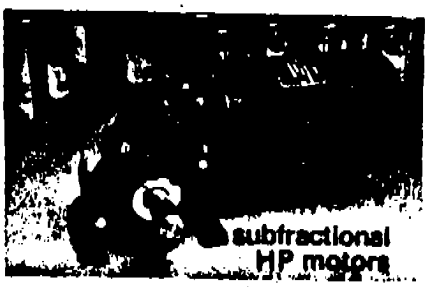




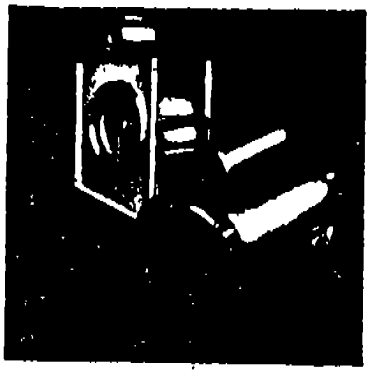
brakemotors



chemical service



subfractional HP motors



rigid base

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