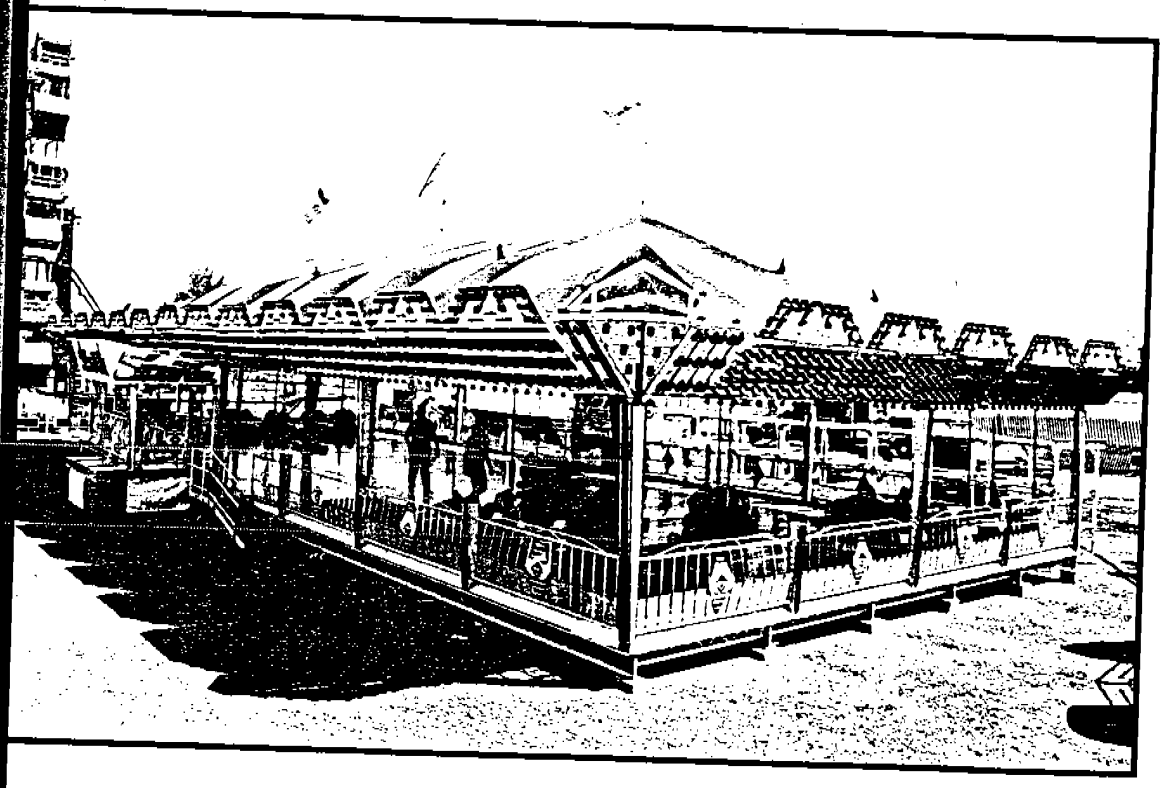
MFG: MAJESTIC RIDES
NAME: SCOOTERS TM-2700
TYPE: NON-KIDDIE

MAJESTIC

OPERATOR'S MANUAL

T. M. 2700 PORTABLE SCOOTER BUILDING



SCOOTER®

Volume No. 2700-90-1

TO THE OWNER AND OPERATOR

This manual contains information concerning the operation, maintenance and safety of your new MAJESTIC SCOOTER building. It should be carefully read before attempting to operate your scooter. You will find many helpful pointers which will assist you in obtaining the performance for which it was designed.

MAJESTIC INC.

Majestic Inc. makes note of warranty or claims arising from the use of this manual and the owner/operator assumes complete responsibility for any decisions made or actions taken based on information obtained from using this booklet.

BE CAREFUL

The notes appearing in boxes throughout this manual are used whenever personal safety is involved. Take time to be careful for you and the safety of your patrons.

IMPROVEMENTS

Majestic Inc. is continually striving to improve its products and therefore reserves the right to make improvements when it becomes practical and feasible to do so, without incurring any obligations or responsibility to make changes or additions to Scooters sold previously.

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SAFETY INFORMATION

Please Take Time To Read All Safety Information

Unsafe operating practices and improper use of this equipment on the part of the operator can result in injuries. Observe the following safety precautions.

1. Proper blocking for trailer and purlings is essential for safe operations. **NOTE:** when setting on soft or sandy ground always use a plywood base for blocking. 3/4 plywood base recommended for trailer is 1' x 2', 1' x 1' plywood base recommended for purlings. Always block purlings.
2. A. When raising or lowering decks never have anyone stand underneath.
   B. **NOTE:** Position hoist cables in center of drive to avoid contact with ceiling panel rollers when raising or lowering decks.
3. Never unhook tractor from ride until all air is out of air bags.
4. When attaching or removing tractor from trailer, never fully extend hydraulic cylinders. Always use landing gear for extended periods.
5. Overheating of 12 volt motors will affect the safe operation of its intended use.
   A. Hydraulic 12 volt motor 5 to 10 minutes continuous use at one time.
   B. Winch 12 volt motor 5 minutes continuous use at one time (if used).
   C. Always connect ground cable in control house before raising or lowering decks (if used).
   D. A fully charged battery to ensure proper amperage to 12 volt motors.
6. Proper size safety keys and all pins is important.
   A. Post Caps
   B. Catwalks
   C. Rafters
   D. Scenery
   E. Purlings
   F. Ramps
   G. Racking
7. ⚠ Never permit customers to run to or from the bumper car.
   NOTE: aluminum decks are slippery when wet.
8. Always have on each bumper car: A. Stinger pole pad
   B. 2 Seatbelts
   C. Steering Wheel Pad
9. Never operate scooter cars without everyone wearing seatbelts.
10. A. Always operate scooter cars at a safe speed.
    B. Recommended speed setting on rectifier is 3.
11. The TM 2700 Scooter building trailer is 48' long, 13'5" in height: extreme caution must be taken when negotiating corners and low overpasses.
12. All Majestic Scooters currently being manufactured are equipped with maxi trailer brakes. It is still advisable to chock trailer wheels when unit is parked.
13. ⚠ **CAUTION! DO NOT WALK ON CEILING PANELS.**
14. After ride is erected, a visual inspection is required to insure there are no electrical shorts between floor and ceiling or other adjacent equipment.
15. To insure safety, the hydraulic switch located with hydraulic pump should be in the off position while ride is in operation.
16. Gate chains or one way gates must be in use while ride is in operation.
17. Never ride on back of cars while in operation.
18. Extreme caution is required in high wind when handling scenery or canvas.
19. Safety is an ongoing process. Every operator must use their own judgment for safety due to constant changes in conditions. We, at Majestic, are always receptive to better ways to improve the safety of our Scooter Buildings.

THANK YOU!

PRECAUTIONARY MEASURES

DO'S

1. **KEEP BATTERY FULLY CHARGED.**
   NOTE: A 10 amp battery charger has a charging rate of 10 amps per hour.
   A 100 amp battery requires 10 hours to charge to full capacity.
   CAUTION! A low battery may damage the hydraulic pump motor or hoist motor.

2. When removing or attaching tractor to trailer, trailer must be resting on landing gear support stands, with hydraulic cylinders raised approximately 1" to prevent damage to cylinders.

3. Position hoist cables in center of drive when raising or lowering decks.

4. Operate scooter cars at a safe, recommended rectifier speed setting of 3.

5. Chock trailer wheels when unit is parked.

6. Release all air from air bags before removing tractor.

7. Have all customers wear their seatbelts.

8. Turn hydraulic pump switch to the off position before operating ride.

9. Close entrance and exit gates before operating ride.

10. Exercise extreme caution in high winds when handling scenery or canvas.

11. Use the Periodic Service Instruction Sheet on Page 11 of the manual to maintain your equipment.

12. Use the Daily Inspection Schedule Sheets provided on Page 21 of this manual.

DONT'S

1. Operate ride unless all necessary blocking is in place under trailer frame and purlings.

2. Remove tractor from trailer until all air has been removed from air bags and trailer is resting on landing gear support stands.

3. Operate electric motors over their recommended maximum continuous usage time.

4. Raise or lower decks unless ground cable has been connected inside control house.

5. Operate ride until all proper support pins and safety keys have been installed.

6. Operate ride unless all stinger pole pads, seatbelts and save-a-tooth have been installed on bumper cars.

7. Walk on ceiling panels.

8. Operate ride until a thorough visual inspection has been made to assure there are no electrical shorts between floor, ceiling or any adjacent equipment.

9. Operate ride unless the hydraulic pump switch is in the off position.

10. Operate ride until entrance and exit gates are closed.

11. Ride on back of cars.

SET UP PROCEDURE

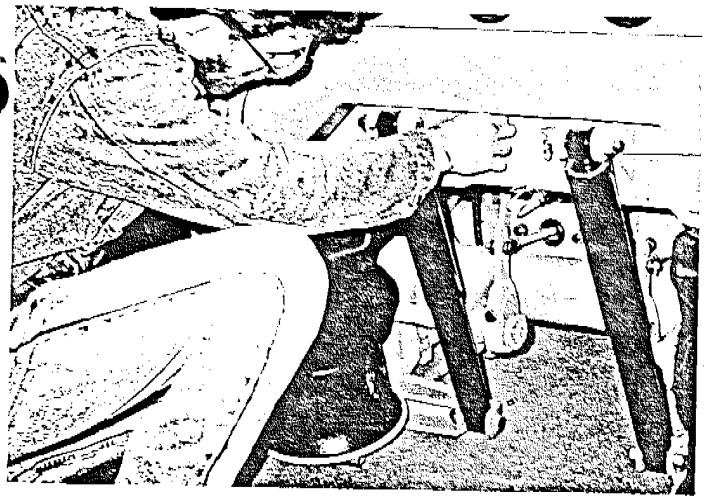

FIGURE 1

1. **PULL RIDE ON LOCATION**. Choose a site as level as possible.
2. **SPACE REQUIRED** for set-up: 50' depth, 90' length.
3. **BEFORE REMOVING TRACTOR** open both air valves on rear of trailer and exhaust all air from bags. (See Figure 1).
4. ⚠ **REMOVAL OF TRACTOR:** (*IMPORTANT*) Raise front of trailer with hydraulic jacks (push buttons located on left side of gooseneck). Crank down mechanical landing gear, then raise hydraulic jacks approximately 1". Remove tractor.

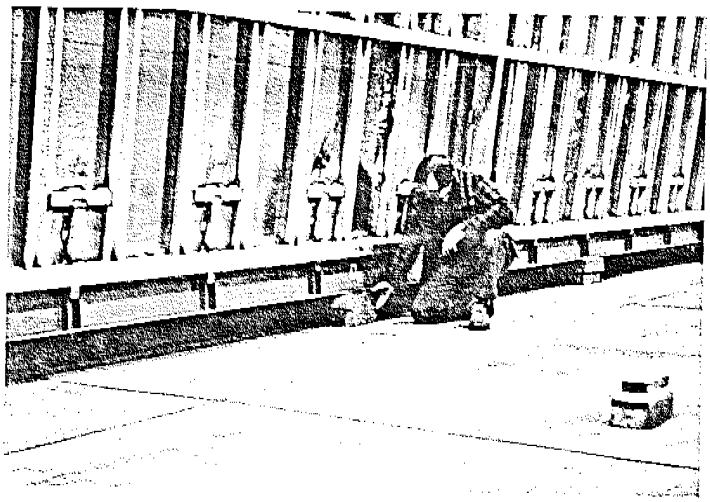

FIGURE 2

5. **LEVELING TRAILER:** (Level Placement: 1. Gooseneck 2. Rear Trailer Frame 3. Right Side Trailer 4. Left Side Trailer). Level trailer using front and rear hydraulic cylinders. Trailer should be blocked in four places on each side as marked.

> ***NOTE:*** Center blocking should be approximately ½" higher than corner of trailer frame. (See Figure 2).

LOWERING DECKS

FIGURE 3

1. **CHOOSE DECK** that has winch cable attached as the first deck to lower.
2. **REMOVE ALL PURLINGS** from side of decks and as they are being removed, place in proper position on ground.

> ***NOTE:*** Start placement minimum of 9' from trailer frame.

3. **REMOVE BOTH T BOLTS** from decks. (See Figure 3).

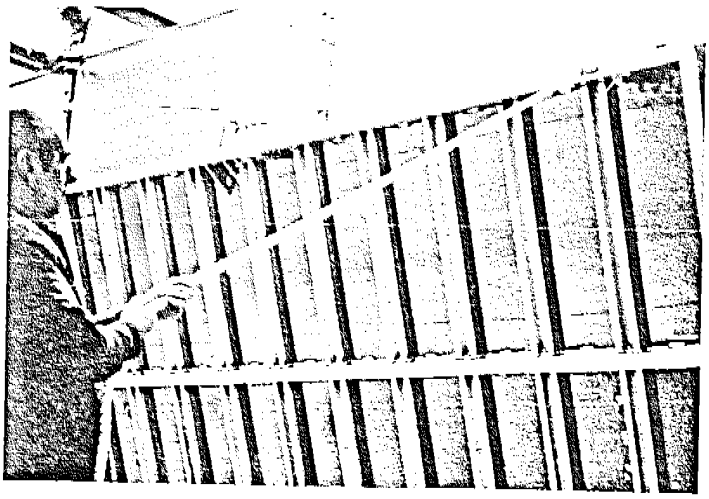

FIGURE 4

> ⚠ ***NOTE:*** Stand at side of deck!

4. **HOOK PULL ROPES** on top deck corners and pull out as decks are being lowered. (See Figure 4).
5. **USE SPIRIT LEVEL** to find approximate level position to block and adjust using the 6 leveling points on deck.
6. **USE LINE LEVEL** (transit) to level deck at all points.

> ***NOTE:*** Check main trailer frame at corners for level and compare to decks.

UNDERPURLINGS

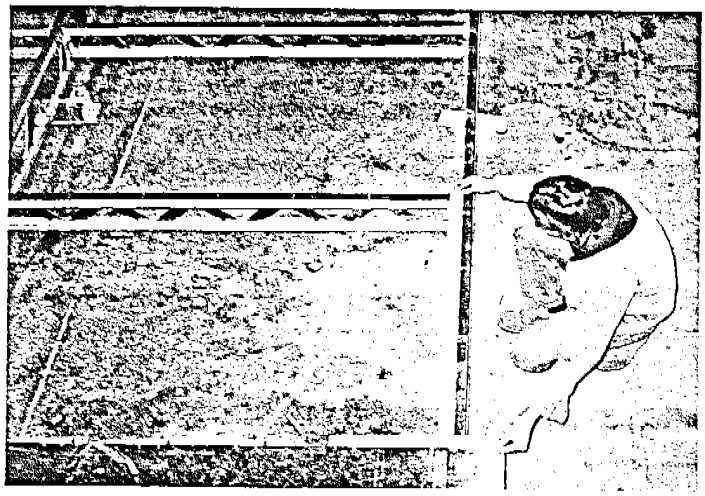

FIGURE 5

1. **PROCEED TO ERECT** first 14' section of framework. Use T square to align end purling and keep it square with deck. (See Figure 5).
2. **PLACE ALL** 14' purlings in place and insert small spreaders in place. Note location of small centerpole purling.

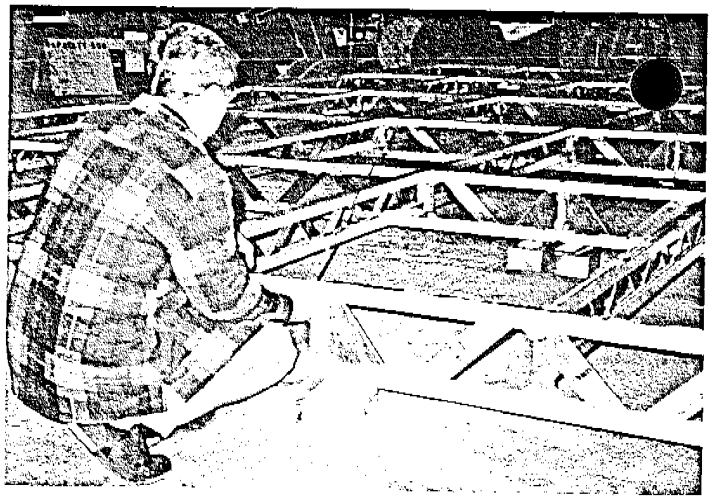

FIGURE 6

3. **X SQUARE PURLINGS.**
4. **LEVEL PURLINGS** with transit.
5. **ERECT OUTSIDE SECTION** of purlings. X square and level with transit. (See Figure 6).

FLOOR PLATES

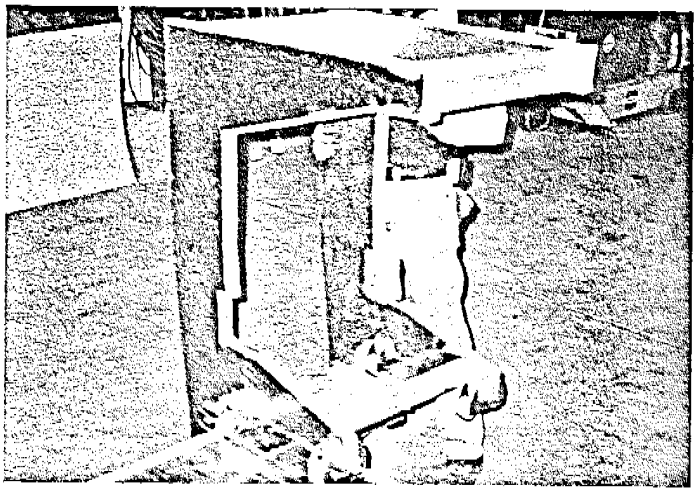

FIGURE 7

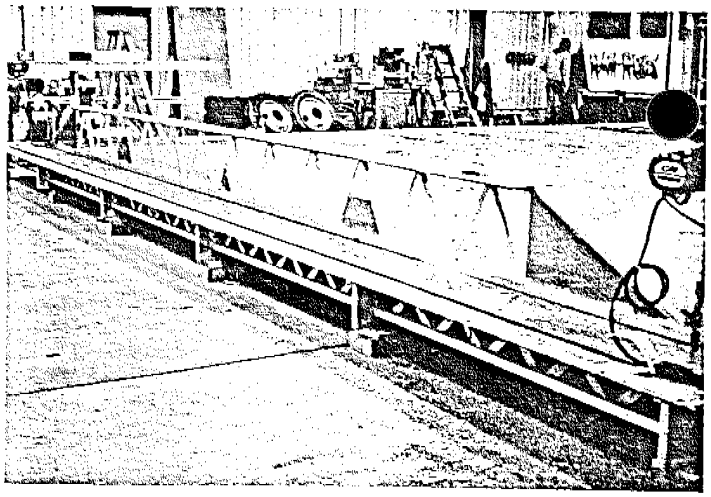

FIGURE 8

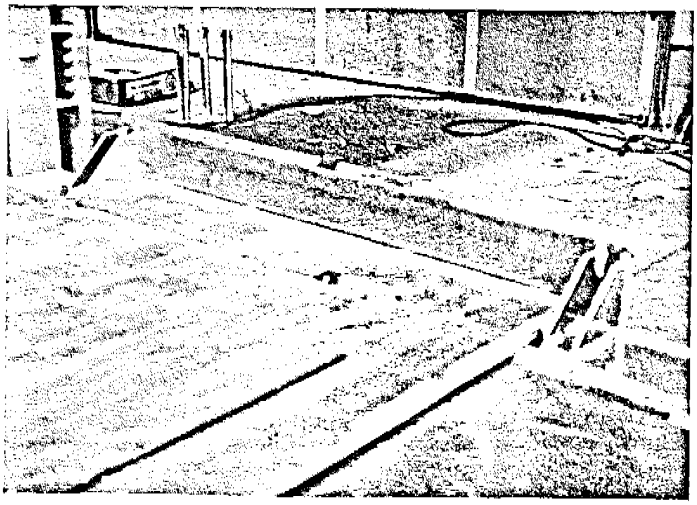

FIGURE 9

1. **ROLL DAVITS** onto primary deck. (See Figure 7).
2. **ASSEMBLE SPREADER LIFT BEAM** and proceed to drop lift beam lugs into key holes in plates and slide into place. (See Figure 8).
3. **LIFT PLATE** with hoist (each end) and push plate sideways on rail and place on purlings abutting primary deck. (See Figures 9 and 10).

> ⚠ ***NOTE:*** Secure each plate to purling before proceeding to next plate.

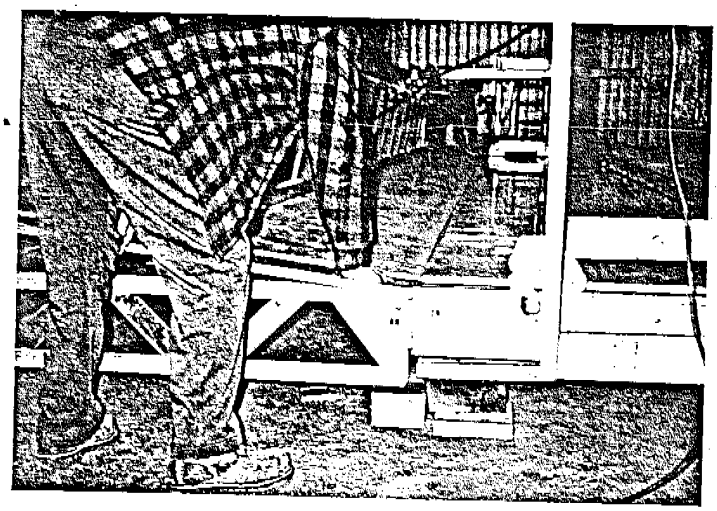

FIGURE 10

4. **PROCEED WITH** remaining 6 plates in order.
5. **CARRY DAVITS** to other primary deck and proceed to remove plates.

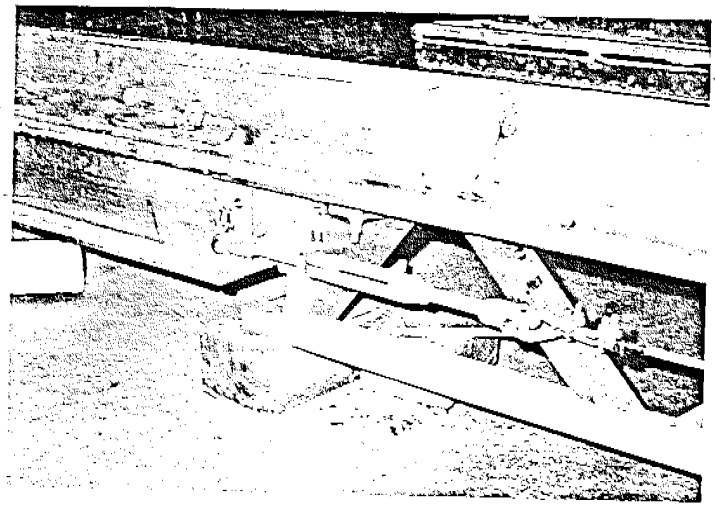

FIGURE 11

6. ⚠ **INSTALL TURNBUCKLE AND CABLE** on decks on each side. This allows for thermal expansion of plates. (See Figure 11).

BUMPER RAIL

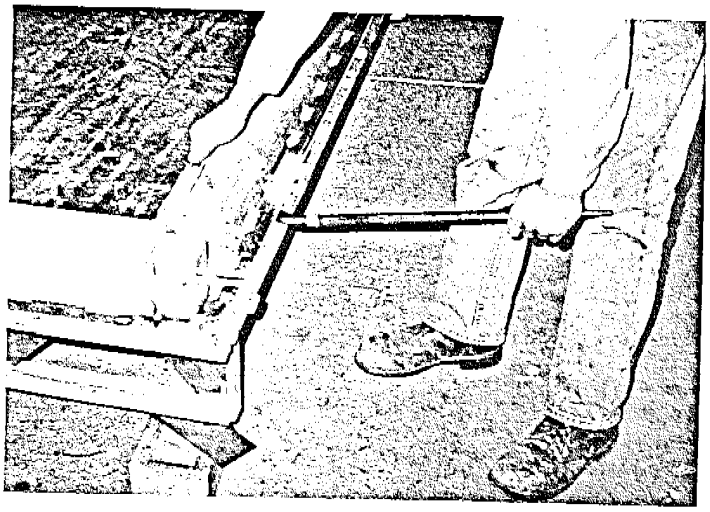

FIGURE 12

1. **INSERT BUMPER RAIL** into place and secure 2 places each bumper rail. (See Figure 12).

POSTS AND FENCE

FIGURE 13

FIGURE 14

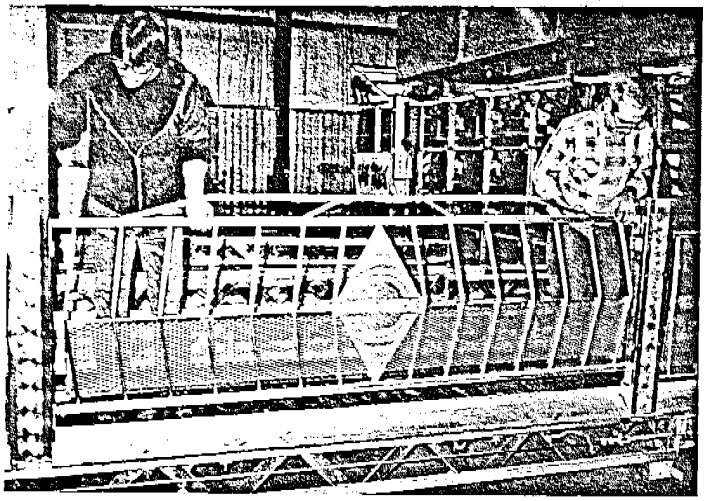

FIGURE 15

1. **SET SUPPORT POSTS** into socket of bumper rail and pin. Set smaller posts between each larger post, n[illegible]s required. (See Figures 13 and 14).
2. **PLACE FENCE** in order between each post. (See Figure 15).

CATWALKS AND RAFTERS

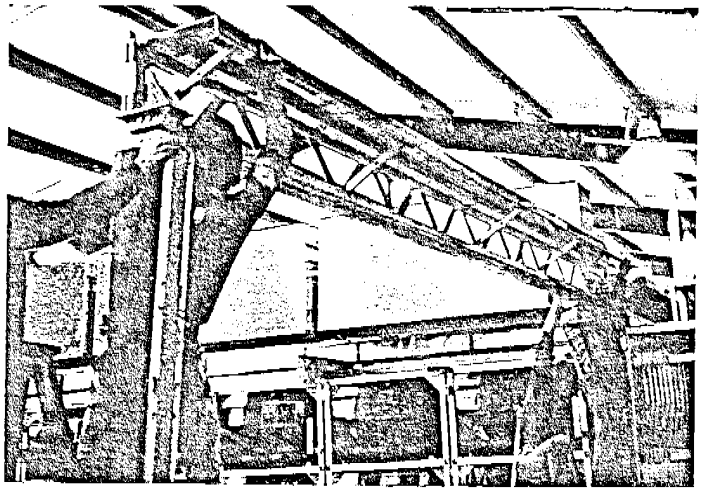

FIGURE 16

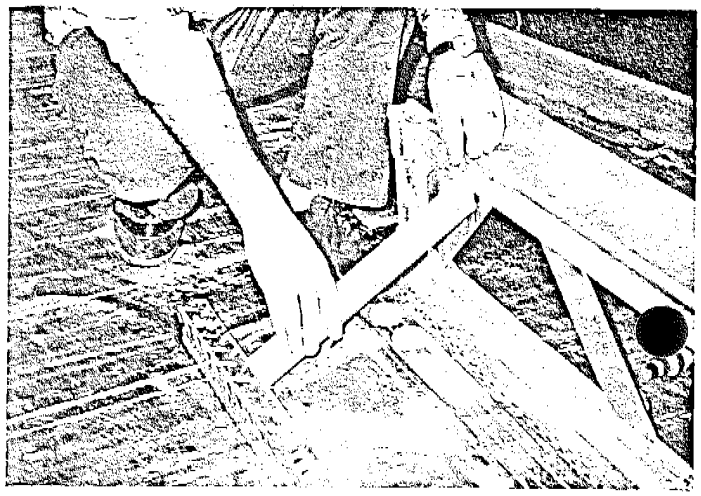

FIGURE 17

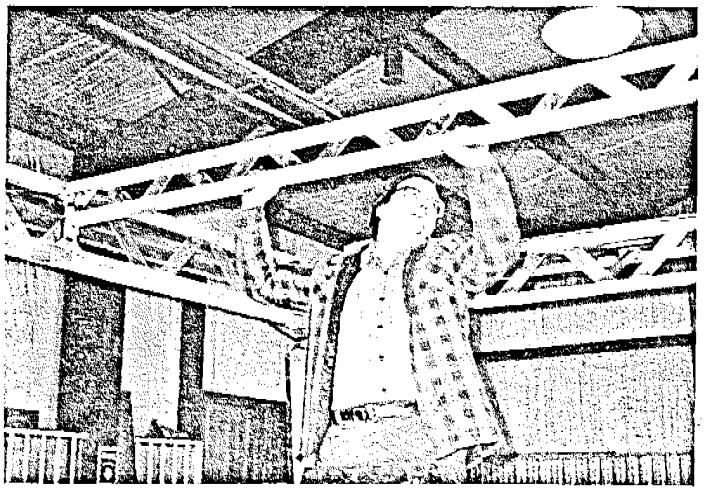

FIGURE 18

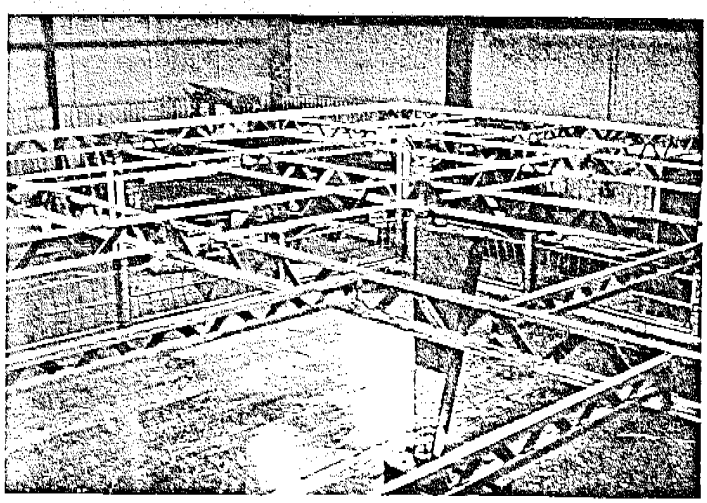

FIGURE 19

1. **REMOVE** all catwalks and rafters from racking and assemble on floor. Place all items in an area close to where they will be used. (See Figure 17).
2. **SLIDE #1** catwalk into dovetail on main top frame and support post at the same time and R key. (See Figure 16).
3. **SAME** for #5 catwalk.
4. **INSTALL #3** rafter (top structure to center post).
5. **PROCEED** to install cross rafter from center post to #1 catwalk.
6. **INSTALL** rafters #2 and #4.

7. **INSTALL** all spreaders.
8. **INSTALL** #1A and 5A catwalk.
9. **INSTALL** #3A rafter.
10. **INSTALL** #1AA catwalk and 5AA catwalk.
11. **INSTALL** #2A rafter and 7A rafter. (See Figure 19).
12. **INSTALL** all spreaders. (See Figure 18).
13. **DUPLICATE** opposite side.

> ⚠ ***NOTE:*** All rafters and spreaders are to be R-Keyed.

CEILING PANELS

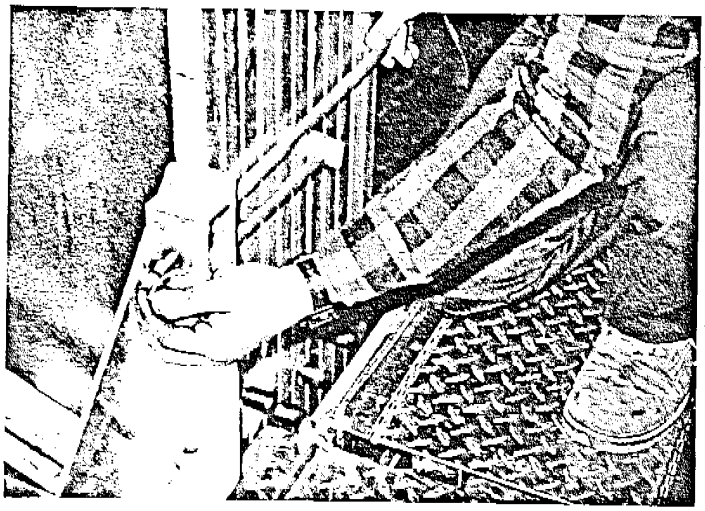

FIGURE 20

1. **REMOVE HOLDER** and lower first 5 panels.
2. **REMOVE SECOND HOLDER** and lower remaining panels.
3. **DO REMAINING** seven sections. (See Figure 20).

SCENERY

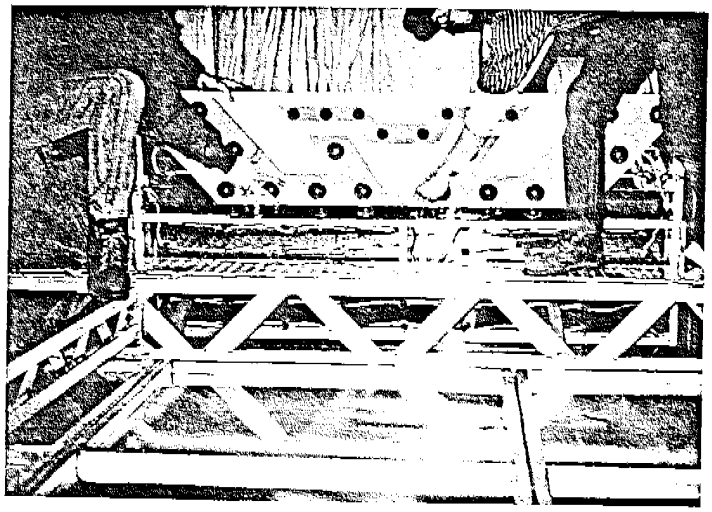

FIGURE 21

1. **CARRY SCENERY** to catwalk and insert in holes in order.
2. **UNFOLD ALL SCENERY** when installed. (See Figure 21).

CARS

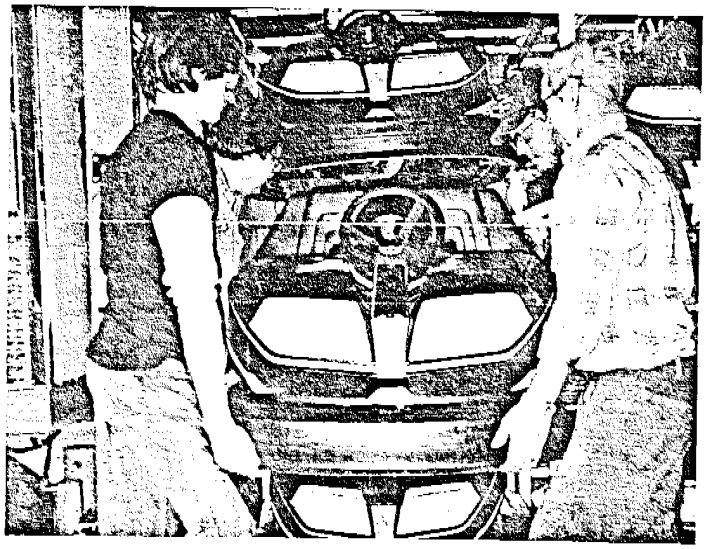

FIGURE 22

1. **LIFT TOP CAR** up and remove rack.
2. **ROLL MIDDLE CAR** off rack and place on floor. Remove rack.
3. **REMOVE BOTTOM RACK** and roll bottom car out onto floor.
4. **LOWER TOP CAR** to floor.
5. **PROCEED TO REMOVE** remaining cars by lifting and rolling out and lowering to floor. (See Figure 22).

CANVAS

FIGURE 23

1. **UNROLL CANVAS** down center of top.
2. **FIND CENTER OPENING** and insert middle center pole.
3. **UNFOLD CANVAS** to next center poie and insert pole. (Each side same.)
4. **HOOK CANVAS** and proceed to raise top.
5. **INSERT QUARTER POLES.** (See Figure 23).

INSPECTION

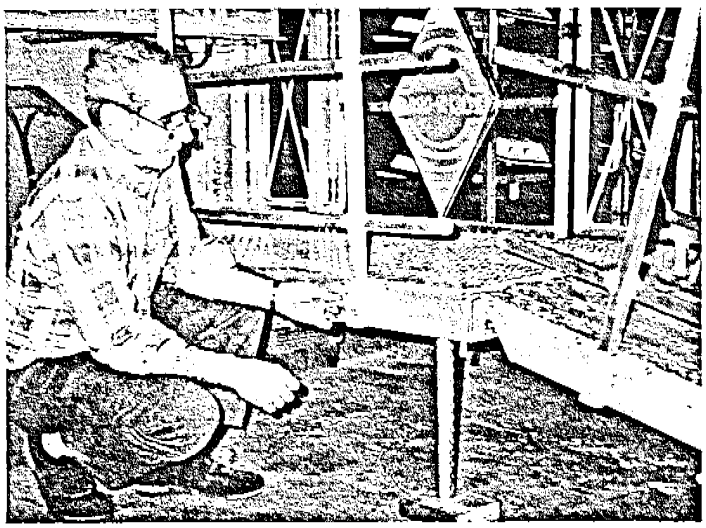

FIGURE 24

1. **INSTALL ALL** ramps and railing, skirting, etc.
2. **READY ALL CARS** for operation.
3. **VISUALLY INSPECT** all around ride looking for a short between floor and ceiling.
4. **CHECK** for all R-keys and pins in place.
5. **USE GOOD JUDGEMENT** when installing entrance and exit ramps. Steep ramps are unsafe. (See Figure 24).

ALL MAJESTIC SCOOTERS are equipped with an automatic 12 volt battery charger. Maintain your 12 volt battery in a full charge at all times. Failure to do so will shorten or cause damage to all 12 volt D C motors.

⚠ **SETTING SPEED FOR BUMPER CARS:** Maintaining a safe speed is not only important for your riders safety, but also saves on maintenance cost due to slower speeds. We recommend a speed depending on the age bracket that gives a rider a comfortable ride without bruises but willing to return to ride the Scooter again. Set speed setting dial at 3.

DISASSEMBLE OF SCOOTER: Reverse all procedures to disassemble your Scooter Building.

ELECTRICAL SERVICE TM 2700 SCOOTER BUILDING

1. POWER REQUIREMENTS	220 Volt, Three Phase, 35 KW, 225 Amp
2. POWER CORD	5 Wire, 100' Standard
3. FLASHING UNIT	Solid State Input: 220 Volt, Three Phase Output: 110 Volt
4. RECTIFIER	DC Power Supply 300-80-230-1 Input: 230 Volts, 1 Ph, 60 Hz, 157 Amps Output: 40 to 80 Volts, 300 Amps DC See Rectifier Manual, Page 15
5. SCENERY	Total Power req. 130 Amps per 35 Panels Total Power req. 3.7 Amps per Panel 110 V Scenery Bulbs, 60 V Starburst Bulbs
6. POST LIGHTS	110 V F-40 Flourescent Bulbs .80 Amp per Post
7. HYDRAULIC PUMP SYSTEM	12 Volt CD Motor Pump Solenoid Coil See Information and Troubleshooting Guide
8. ELECTRIC HOIST SYSTEM	220 Volt, 3 Phase, 2 HP Klockner-Moeller Control Unit 50-1 Gear Reducer
9. IMPROPER ELECTRIC HOOK-UP TO SCOOTER BUILDING WILL CAUSE DAMAGE TO	Flourescent Lights Flashing Unit Profit

PERIODIC SERVICE

	No. #	IDENTIFICATION	SERVICE	SERVICE INTERVALS IN HOURS 10 50 100 200 500 1000 2000	CORRECT MATERIAL
SCOOTER BUILDING	1.	TRAILER TIRES	PROPER.MAINTAIN INFL.		255/70 R, 115 PSI
	2.	TRAILER GOOSENECK	GREASE		MULTI-PURPOSE GREASE
	3.	HYDRAULIC	REPLACE IF CONTAMINATED		DEXTRON A.T.F.
	4.	BATTERY	FULLY CHARGE		A 10 amp battery charger will take 30 hours/charging on a 300 amp battery
	5.	TRAILER & DECK HINGE PINS	MONTHLY		20 W OIL
	6.	DECK SURFACE	DAILY		SWEEP
	7.	DECK SURFACE	END OF SEASON		CLEAN WITH A MILD ACID DETERGENT
	8.				
	9.	SCENERY LIGHTS	REPLACE IF NEEDED		ALWAYS DISCONNECT POWER 110 VOLT - 60 VOLT
	10.				
	11.	GEAR BOX	CHECK FOR PROPER LEVEL TOP PLUG ON SIDE		REPLACE WITH EP-85-140 GEAR OIL
	12.	WINCH CABLES	CHECK FOR ABNORMAL WEAR		BOTH CABLES MUST BE SAME LENGTH 19', DIAMETER 5/16"
	13.	PILLOW BLOCKS	GREASE		MULTI-PURPOSE GREASE
	14.	SNATCH BLOCKS	OIL WEEKLY		20 W OIL
	15.	WINCH ROLLERS	REPLACE		MAJESTIC ROLLERS
	16.	TRAILER AXLE	OIL		EP-85 - 140 GEAR OIL
BUMPER CARS	1.	CAR LIGHTS	REPLACE IF NEEDED		24 VOLT - 30 VOLT
	2.	BUMPER TIRE	13 to 16 PSI AND TIRE CONDITION		SILICONE SPRAY
	3.	CAR MOTOR	BLOW-OUT		COMPRESSED AIR
	4.	PEDAL-UNIT	CHECK COPPER BLOCKS FOR WEAR - OIL PEDAL HINGE		40 W OIL
	5.	CAR TRANSMISSION	CHECK FOR LEAKAGE		REPLACE AND REFILL WITH SHELL ALVANIA Z TO THE PROPER LEVEL
	6.	CLUTCH LINING	CHECK FOR WEAR		REPLACE AFTER 30,000-50,000 RIDERS PER CAR
	7.	BELL HOUSING	GREASE		MULTI-PURPOSE GREASE
	8.	IRON WHEEL	CLEAN		WIRE BRUSH OR SAND PAPER
	9.	DRIVE WHEEL	INSPECT FOR WEAR		REPLACE IF WORN
	10.	DRIVE WHEEL AXLE	INSPECT FOR WEAR		REPLACE IF WORN
	11.	TROLLEY WHEELS	LUBRICATE		1 DROP CHAIN OIL
	12.	TROLLEY BRACKET	LUBRICATE		VASOLINE

INFORMATION AND TROUBLESHOOTING GUIDE FOR D.C. POWER HYDRAULIC UNITS AND CYLINDERS

TEST EQUIPMENT

The following is a list of the test equipment required to troubleshoot D.C. powered hydraulic systems.

1. PRESSURE GAUGE: 0-5000 PSI pressure gauge, preferably glycerine filled, is a very valuable and relatively inexpensive tool for checking pressure in the various sections of the circuit.

2. D.C. TEST LIGHT: A test light is simply a light bulb which has one end connected by a wire to an alligator clip and the other end connected to a metal probe. It is used to check the electrical circuit when the battery is connected to the system. The alligator clip is grounded and the light glows when the probe comes in contact with a "HOT" electrical component. They are easily obtained from automotive jobbers or discount stores.

3. CONTINUITY LIGHT: A continuity light is like a test light but contains its own battery power source. It is used for testing electrical circuits when the components are not connected to a battery. They are easily obtained from discount stores or electrical jobbers at modest cost.

4. VOLT METER: A D.C. volt meter, as used in the automotive repair business, is a good investment for troubleshooting problems that are related to low voltage. They are used in two ways:

First - one probe is grounded while the other is used to probe the "HOT" leads, the meter shows the voltage available at the point where the second probe is connected.

Second - they can be used to measure a voltage drop in a wire. One probe is connected to one end and the remaining to the other end. The reading is the voltage drop.

5. OHM METER: An OHM meter is used to measure resistance and is a very useful tool when working on wire circuits and solenoid coils. On some coils the wire resistance is up to a level where a D.C. test light might show an open circuit and it really is not so. An infinite meter reading on any test shows that the circuit is open. A coil test, however, will always show some value of resistance but it must not be infinite. All tests conducted with an OHM meter must be done with the battery disconnected from the system.

6. ASSORTED HOSES, HIGH PRESSURE FITTINGS: These can be used to connect and/or isolate certain parts of a hydraulic circuit to a pressure gauge or a shutoff valve for diagnosing hydraulic problems.

7. HIGH PRESSURE SHUTOFF VALVE: The shutoff valve can be used to choke off oil flow so that a "false" load can be put on the pump and other components. With the valve installed it can be slowly shut off while the equipment listed above records the data for making a proper diagnosis.

HYDRAULIC FLUID

1. THE PURPOSE OF OIL: The main purpose of hydraulic fluid is to transfer power from the pump to the actuators but it must also perform many other tasks which are critical to a well designed system. First, the oil must have good lubricity or be "slippery" so that the friction will be as low as possible to keep metal to metal wearing at a minimum. Second, the viscosity or "thickness" must be in the proper range at the operating temperature so that unwanted leakage will be at a minimum, but will still allow the oil to lubricate the close fitting parts in the system. (Oil that is too thin will leak past seals, valve spools, and the gears; oil that is too thick will not flow properly and cause the pump to cavitate or starve.) Third, the oil must be compatible with the seals used in the system. Fourth, there should also be additives in the oil to slow down the effects of rust, oxidation (oxygen in the air combining with the oil to form sludge), foaming, and water settling to the bottom of the reservoir. Fifth, the oil must be able to pour or flow at the lowest expected temperature so that the oil can reach or get into the pump. For all of the reasons just listed, automatic transmission fluid (ATF) was found in most cases, to be the best readily available fluid for the job in most climate conditions.

2. SELECTING FLUIDS FOR APPLICATIONS OUTSIDE OF ATF'S TEMPERATURE RANGE: When looking for fluids that can be used in the place of automatic transmission fluid or for applications where the operating temperature is outside of the range of automatic transmission fluid the following specifications should be discussed with your local oil distributor:

A. Fluid must be compatible with Buna-N sealing compounds.

B. The pour point must be below the lowest anticipated temperature that will be encountered.

C. It should contain rust and oxidation as well as other detergent type inhibitors.

D. The viscosity (SUS) should lie between 80 as a minimum and 375 as a maximum in the operating range, with the ideal viscosity near 200 SUS.

E. The viscosity index should be as high as possible.

As an example, automatic transmission fluid (ATF) has the following specifications as listed by most oil manufacturers.

Viscosity (SUS)	
100° F.	185 to 205
210° F.	45 to 55
Pour Point	-45° F. to -35° F.
Viscosity Index	145 to 165

NOTE: In an emergency for cold weather applications SAE 10W non-detergent oil mixed by volume with no more than 30% #1 fuel oil or kerosene can be used.

PUMPS

1. TYPE AND REPAIR: All monarch pumps are of the external gear type. They are not complex in construction and if properly maintained give years of trouble free service. Before accusing or disassembling the pump because of failure, make certain all other possibilities have been considered as the close tolerances can be disrupted by disassembly.

A. Pump disassembly (Model M-XXX)

1. Loosen and remove the eight ¼" - 20 socket head cap screws.
2. Remove suction plate.

> ***NOTE:*** WATCH FOR THRUST BALL ON DRIVE SHAFT.

3. Remove idler gear and shaft as an assembled unit.
4. Remove the "spiral lock" from remaining drive shaft.
5. Remove drive gear.
6. Remove key on drive shaft.
7. Remove cylinder plate.
8. Remove dowels.
9. Remove remaining "spiral lock" on drive shaft.
10. Remove wear plate.
11. Remove drive shaft through base.
12. Replace seal in base whenever rebuilding pump unless no evidence of leak exists. (See Section B below.)
13. Use care when installing shaft back through seal so as not to cut lip. (Grease seal lip before installing shaft).
14. Install all remaining parts in reverse order replacing those that are scored or damaged.
15. Torque socket head cap screws to 125-150 lb. in.

B. Seal Failure - A cut or damaged lip on the seal, a bad fit on the outside diameter, or a seal that is "blown" partially out of the seal cavity will allow air to be drawn into the pump and will be evidenced by foaming oil and a pump that will not reach high pressures. Repair as outlined above in Section A.

PUMP PRIMING

1. NEW INSTALLATIONS: New system installations, as well as those that are disassembled for repair, require proper priming to avoid possible pump failure. A pump is said to be "primed" when the internal cavity is full of oil and the air has been expelled.

A. Prime a pump as follows:

1. "Crack" or remove the high pressure line at or near the cylinder.
2. "Jog" the unit until oil flow is clear. (Air is absent).
3. Retighten or replace hose.

2. ON SYSTEMS THAT FAIL TO PRIME OR LOOSE THEIR PRIME, CHECK FOR THE FOLLOWING:

A. Correct unit mounting position in the case of a pump-motor-reservoir combination. It is either horizontal or vertical and failure to mount in proper manner could mean pump cannot prime (pick up oil) because the suction is not submerged in the oil at all times.

> ***NOTE:*** All pumps designed for vertical mounting have a label stating such.

B. Proper reservoir size. (See Reservoir Section.)

C. Partially clogged suction filter. (See Filter Section.)

D. A loose or improperly installed suction hose or pick up tube.

E. A bad front pump seal. (See Pump Section.)

F. A solid fill plug in reservoir with no vent. (See Reservoir Section.)

G. Oil that is too thick (See Hydraulic Fluid Section), or contaminated with water. (See Reservoir Section.)

H. Occasionally a pump will not prime itself because a check valve spring in the high pressure port is too "stiff" or the spring retainer is turned down too far. If this condition is expected, loosen the spring retainer (it is found in the ⅜ high pressure outlet port), energize the pump to prime it, and then turn the retainer back to the correct depth. (See Section on Check Valves.)

RESERVOIRS

1. USE RECOMMENDED FLUID: Fill reservoir with the approved fluid as specified on the label next to fill hole. (See Hydraulic Fluid Section.)

2. CORRECT FILLING AND OPERATING PROCEDURE:

A. Fill reservoir to within ½" from the top with all the cylinders in the fully retracted position.

B. Operate unit several times starting with short cylinder strokes and increasing length with each successive stroke.

C. Recheck oil level often and add as necessary to keep pump from picking up air.

D. After system is completely "bled" collapse all cylinders, check oil level in reservoir, and install the filter/breather plug provided.

> ***NOTE:*** Do not use a solid plug or a fill cap without a filter/breather element or damage will be caused to pump and/or reservoir.

3. PROBLEMS ASSOCIATED WITH THE RESERVOIR:

A. Clear oil flowing out of fill hole usually points to either one of the following:

1. Cylinders were not fully collapsed when reservoir was filled.
2. Reservoir is too small for cylinders total stroke.

B. Foamy oil flowing out of the fill hole points to the following:

1. Air is present in the system; that is, cylinders and fluid lines. The response usually is "spongy" and the cylinder moves with "jerking" motion.
2. There is no drop tube or "down spout" on the return line so that the oil is not returning to the bottom of the reservoir.
3. The return oil velocity is excessive; to correct add a flow control valve to slow velocity, increase size of "down spout", add a diffuser, or use a larger reservoir to increase depth of oil above the end of the return tube.
4. The reservoir is too small to supply the volume of oil required by the cylinders and the pump picks up air when the oil level drops below the suction pick up tube.
5. Damage to pump seal. (See Pump Section.)

C. Water in the oil. Water can enter the reservoir through the fill hole if the unit is left outdoors or washed with high pressure washers. Protect the unit, whenever possible, and change oil regularly to minimize problems. In cold weather the water will freeze and the pump will not work until the ice melts.

4. TIPS AND COMMENTS:

A. In most cases the reservoir is made to be mounted either vertically or horizontally and improper mounting will not allow it to be filled to capacity. (See Pump Priming Section.)

B. On units with a remote reservoir, try to mount it above the pump whenever possible to "flood" the inlet.

C. One of the functions of the reservoir is to keep the oil in the proper temperature range. If the reservoir cannot dissipate enough heat, increase the size in order to bring the temperature down to the proper level. (See Hydraulic Section.)

FILTERS

1. SUCTION FILTERS: All Monarch hydraulic controls have suction filters which must be cleaned periodically or whenever flow is slow or sluggish. Some filters can be washed in cleaning solvent and blown dry with compressed air. Those which cannot be cleaned properly should be replaced. External high pressure filters may be added to the system for added protection and ease of cleaning.

2. ADDITIONAL SYSTEM FILTERS:

A. Models M-303, M-503, M-603 and M-723. These specific models have filters in addition to the pump suction filter for protecting the valve. One is located inside the two-piece hex fitting just ahead of the DR (2-way, 2-position) lowering valve inside the reservoir. It can be taken apart for cleaning or replacing the filter element. The other filter is a "body" filter located in the cartridge of the DR lowering solenoid valve. It can be replaced by removing the cartridge from the square valve block.

B. Models in M-640 Series. These models also are equipped with additional filters for protecting the solenoid valves. First; each port, C_1 and C_2 on the flat surface have a cone shaped filter in the valve body. They can be reached as follows:

1. If the ports, C_1 and C_2, on the flat surface are not being used, remove the flush ¼" pipe plugs.
2. If the ports, C_1 and C_2 on the flat surface are being used; remove the hoses.
3. Reach down into these ports with a ¼" allen key and remove the filter retainer screws.
4. Remove the filters and clean or replace as necessary.
5. Reassemble in reverse order.

Second: each valve cartridge has a "body" filter to provide additional protection from dirt. To clean or replace these filters the valve body must be removed from the reservoir and the cartridge removed from the body. Clean with solvent and compressed air or replace as required.

C. Models in M-670 and M-680 Series. Like the M-640 series, these models also have port and cartridge filters. The port filters are located just below the surface in each outlet (C_1, C_2, C_3). To clean or replace, proceed as follows:

1. Remove the hoses from the valve body.
2. Remove the filter retainer screws with a ¼" allen key.
3. Remove and clean or replace filters as required.
4. Reassemble in reverse order.

The cartridge "body" filters are removed and repaired in the same manner as described in the M-640 models above.

> ***NOTE:*** Do not use teflon tape on hydraulic fittings as it can easily jam valves and plug the filters in the system.

ELECTRICAL PROBLEMS

> ⚠ ***NOTE:*** **REMOVE ALL RINGS, WATCHES, ETC. PRIOR TO DOING ANY ELECTRICAL WORK!**

1. LOW VOLTAGE: Operating direct current (D.C.) power units efficiently requires proper voltage. Any attempt to operate below the minimum required voltage could cause system failure.

A. Signals which indicate low voltages are:
1. Motor running at reduced speed.
2. Solenoid valves not shifting.

B. Minimum voltage readings are as follows:
1. The minimum voltage between the motor stud and ground is 9.0 volts at maximum load conditions.
2. The minimum voltage between the valve solenoid power wire ("hot wire") and ground is 9½ volts at maximum load conditions.

C. Causes for low voltage are:
1. Battery capacity too small.
2. Cable ends not electrically secure to battery cable. (Solder them if necessary.)
3. Battery cable size too small for load and length of run. Copper #1 automotive battery cable is the recommended minimum size. (The wire core diameter of #1 battery cable is approximately ⅜"). Larger copper battery cable, #0 or #00, may be required for cable lengths over 16 feet to keep performance from deteriorating.
4. Ground cable size not equivalent or larger than battery cable.
5. Bad joints where cable ends are bolted to battery, motor solenoid, start switch, ground and etc.
6. Burnt contacts on motor solenoid or start switch.

D. Check for low voltage as follows: (A volt meter will be required.)
1. On vehicles equipped with an alternator, the voltage should be approximately 13.5 volts with no electrical accessories operating and the engine running. Check it.
2. Operate pump unit under maximum conditions. This would be either under full load or when pump is running over relief (cylinder dead headed). Use the volt meter to probe each connection, cable end and cable from the battery all the way back to the motor stud and note the voltage losses. Make the necessary repairs. Increase the voltage above the minimum required.

> ***NOTE:*** Check the ground side as well, paint, rust and dirt are insulators. Remove them.

2. D. C. MOTORS: Motors should be serviced periodically to insure good performance. Service as follows:

A. Remove head assembly from motor.

B. Check sleeve bearing in head assembly for wear.

C. Place a few drops of oil on felt liner in head assembly.

D. Check brush set for wear and replace if necessary.

E. Blow dirt and dust out of motor housing and check for shorts, burnt wires, or open circuits in the field coil assembly.

F. Check armature and commutator for shorts or open circuits.

G. Check ball bearing on motor shaft. A growling motor can be caused by bad bearings.

H. Check for excessive "end play" of armature and add thrust washers as required.

I. If there is an excessive amount of water, condensation, or rust in the motor, a small drain hole may be drilled in the motor case on the low side of the motor depending on the mounting. Consult with factory for additional information.

> ***NOTE:*** A motor that does not turn in freezing weather could be caused by water that has frozen inside the housing.

J. All Monarch D.C. motors rotate counterclockwise when viewed from drive end. Check it when replacing motor with a new one.

K. If motor fails to turn the pump, check the pump by turning the shaft by hand. It may be "set up". (See Pump Section.)

3. ELECTRICAL SWITCHES:

A. "Contact finger" switches (Manual Valves). All models that use a contact finger(s) attached to the handle or shaft of a manual valve to start the D.C. motor, do so by "grounding" the small post of a solenoid start switch. When repairing systems with contact fingers, check for the following:

1. Improperly aligned or broken contact finger.
2. Nub nut assembly that is not insulated from ground.
3. Wires that are bare or shorted to ground.

B. Motor start solenoid switches. Although there are exceptions, most solenoid switches found on Monarch systems are one of the following two types:

1. 3-Post solenoid switch (See Figure 1).
   a. The three post solenoid switch is wired and constructed as follows:
      1. The large post marked "Bat" must be attached to the cable leading from the battery.
      2. The small post connects to the control circuit. (Contact finger, push button, toggle switch, etc.)
      3. The remaining large post attaches to cable leading from the motor.
2. Solenoid Coils: Coils are used in solenoid operated valves and solenoid start switches. Failures can be caused by vibration, water, improper voltage or corrosion. The best way to test a coil is with an OHM meter. The meter should read some value of OHMS and an infinite reading means that the coil has an open circuit. The reading between any lead on the coil and the "can" should be infinite unless there is only one lead wire and the coil is grounded to the can.

RELIEF VALVES

1. THE PURPOSE OF A RELIEF VALVE IS TO:

A. Limit the max pressure in the system to a safe level.

B. Keep the amp draw and battery drain at a minimum when the cylinder "dead heads" reaches full stroke.

2. THE TWO STYLES OF RELIEF VALVES USED BY MONARCH ARE:

A. Internal style - An "internal" cavity is drilled into the pump base into which the following parts are inserted to make up the relief valve assembly.

1. Ball or cone
2. Heavy spring
3. Adjusting screw

B. External style - A relief valve mounted "outside" of the pump base in a housing of some kind is called an external style (inline). It is made up of the following parts:

1. Ball or cone
2. Heavy spring
3. Adjusting screw
4. Housing - usually hex-shaped

3. DIAGNOSING AND REPAIRING RELIEF VALVES:

> ***NOTE:*** When testing or making adjustments on the relief valve, the system must be "dead headed" (cylinder at full stroke or in a position where cylinder movement is zero).

A. Relief valve pressure too high.

1. Symptoms:
   a. Amp draw and battery drain excessive when system is "dead headed".
   b. Motor RPM is slow in comparison to full load system operation.
2. Repair procedure:
   a. Turn relief valve adjusting screw counterclockwise using a gauge, tee'd into the high pressure line, to record the proper pressure setting.

> ***NOTE:*** On the "internal" relief valve the flush ¼" pipe plug will have to be removed to reach the adjusting screw (see label). On the "inline" style relief valve the return lines, threaded into the back, will have to be removed in order to reach the adjusting screw. The "internal" relief valve is adjusted with a screw driver and the "inline" relief is adjusted with a ¼" allen key.

B. Relief valve pressure too low.

1. Symptoms:
   a. Motor RPM is "faster" than normal.
   b. Cylinder will not extend.
   c. Excessive turbulence in the reservoir.

> ***NOTE:*** On applications where the cylinder is be[illegible] replaced or the mechanical mechanism is being modified, make sure the pressure capability of the pump is not being exceeded.

2. Repair procedure.
   a. There are two possible causes for lack of pressure:
      1. The adjusting screw has backed up.
      2. Foreign matter or "dirt" is trapped between the seat and the ball or cone.
   b. Repair as follows:
      1. Using a gauge, tee'd into the pressure line, turn the adjusting screw clockwise a turn or two and watch the gauge. If it goes up, continue to turn the screw until the required setting is reached. If the screw does not remain in the correct position, replace it with one that has a locking patch. (In an emergency the screw threads can be deformed slightly with a small prick punch and hammer to hold the setting.)
      2. If the pressure does not climb when the adjusting screw is tightened; turn the adjusting screw counterclockwise all the way out; energize the pump to "flush" the dirt past the seat. (Caution: use hand or a piece of hose to divert oil into a contain[illegible] Do not look into the port.) Inspect the co[illegible] or ball for nicks and replace if necessary. Reseat the ball or cone using a small drift punch and hammer with a light tap. Reinstall spring and screw and reset the pressure.

> ***NOTE:*** In an emergency, if a pressure gauge is not available, turn the relief valve screw in until the cylinder moves under worst conditions and then tighten ½ to ¾ turns.

3. If the above mentioned procedure fails to increase the relief valve setting, check for a worn pump. (See Pump Section) or leaking cylinder (See Cylinder Section).

> ***NOTE:*** Do not use teflon tape on hydraulic fittings as it can easily jam valves and plug the filters in the system.

DIRECTIONAL CONTROL VALVES

1. MANUAL VALVES: This type of valve is operated by a handle or control rod of some kind. Two styles are used on D.C. systems.

A. The rectangular 3-Way Style

1. These valves operate as follows:
   a. The handle is connected to a cam.
   b. The cam moves the "quill" back and forth to either block flow to reservoir and thereby forcing oil into the cylinder, or to push the ball off the seat in the "check" portion of the valve to allow the oil to return to the reservoir.

> ***NOTE:*** Only one of these valves can be used in a system (unless there is a selector ahead of it) and it must be last in the circuit.

2. Troubleshoot and Repair as follows:
   a. If the load "raises" slow, and the valve [illegible] suspected, check for:
      1. A loose handle on the cam-shaft.
      2. Cam surface worn on cam-shaft.
      3. "Quill" cam slot worn.

4. Handle stop is hitting valve block so that quill is not being forced to block flow.

NOTE: Remove the reservoir return line and observe the flow going to reservoir when the valve is in the raise position - it should be zero or close to it.

b. If the load does not hold or will not come down, check the following:
   1. Handle loose on cam-shaft.
   2. Cam surface worn on cam-shaft.
   3. "Quill" cam slot worn.
   4. Check portion of valve is dirty or damaged. See section on check valves (external ball type) for repair.
   5. Check valve shell is out of adjustment. Bring it back into proper adjustment by using gasket-shims between it and the housing.
   6. Broken or stretched spring(s).

B. The Round or Cylindrical Style Valve.
   1. These valves operate as follows:
      a. The handle is connected and aligned to a rotor by a shaft.
      b. The rotor is held and returned to the "Center" position by a torsion spring and two spring pins.
   2. Troubleshoot and repair as follows:
      a. If the valve does not direct the oil properly when "shifted" check for:
         1. A misaligned or loose handle on the shaft caused by a loose set screw. Retighten the set screw making sure that it enters the center of the locating hole in the shaft.
         2. A fractured or bent split-pin between the rotor and shaft. Disassemble the valve and replace the split-pin.

NOTE: Before you disassemble the valve, mark all of the plates so they can be reassembled in the correct position.

b. If the valve leaks oil, replace the O-rings. There are O-rings on the shaft and between the plates. To replace them requires that the valve be disassembled. (See note above).

NOTE: For electrical problems associated with manual valves, see the electrical contact-finger switch section.

HYDRAULIC CYLINDERS

1. DIAGNOSING AND TROUBLESHOOTING CYLINDERS:

A. Single Acting (Ram Type)
   1. Most ram type failures are caused by one of the following reasons:
      a. Excessive side load.
      b. Stroking the rod to full extension.
   2. Excessive side load can be diagnosed by observing the following:
      a. Cracked gland nut.
      b. Gouged rod.
      c. A cocked or bent rod that will not retract back into the tube.
   3. Over stroking can be diagnosed by observing the following:
      a. Premature leakage past the V-rings.
      b. System filters that become prematurely clogged with pieces of rubber due to V-ring crushing. (See Section on Filters.)
         1. Provide a mechanical stop or electrical switch to prevent over stroking.

B. Double Acting
   1. In addition to the same types of failures as found in single acting ram type cylinders (See above) it is also possible to have a piston seal failure. This failure will show up as a cylinder drift in the hold position. Troubleshoot in the following manner:
      a. Put the cylinder in a hold position.
      b. Place a jack under the load.
      c. Remove the high pressure hose from the cylinder port on the side OPPOSITE the holding end.
      d. Let the jack down slowly, if the piston seal is bad, oil will escape from the port.

NOTE: **DO NOT GET NEAR THE LOAD . . . USE CAUTION!!!**

2. REPAIRING HYDRAULIC CYLINDERS:

A. Single Acting Cylinder
   1. Remove cylinder from the installation. Disconnect hose line(s) and drain oil.
   2. Remove gland nut, rod, spreader and packing assembly from the tube assembly.
   3. Clean internal tube and inspect chrome rod for gouges, scratches, or wear. Replace if necessary.
   4. Place chrome rod back into tube assembly.
   5. Insert steel spreader.
   6. Grease the V-ring set on the inside and outside diameters.
   7. Reinstall one V-ring at a time making sure each V-ring lies flat on the ring prior to it.
   8. Replace the gland nut complete with a new wiper ring if worn and thread it down until it makes contact with the V-rings then tighten an additional 1½ to 2 turns. The distance between top of threaded collar and the bottom of large section on gland nut should be 5/16" to 1/4". Do not overtighten.

NOTE: If it is possible to stroke the cylinder after repair, turn gland nut until it contacts V-rings, stroke the cylinder to allow rings to seat and align, then retighten as described above.

B. Double-Acting Cylinder
   1. Follow the exact same procedures (1), (2), and (3) above.

2. Double acting cylinders have two piston cups on the internal threaded end of the chrome rod. If these cups are worn they must be replaced to insure a proper seal. It is also advisable to check the piston "O" ring and the stuffing box "O" ring and replace if signs of wear exist.

NOTE: When replacing piston on the rod have O-ring well greased and screw the piston past the threads to prevent damage to the new O-ring.

3. Replace V-rings, spreader and gland nut described in (5), (6), (7), and (8) above.

TROUBLESHOOTING
ONLY TO BE DONE BY A QUALIFIED ELECTRCIAN

REFER TO YOUR W/D NO. B20024-4.

1. Insure that you have 230 volts line input at L1 and L2.
2. Insure that you have 120 volts A.C. on the output of the control transformer, (T2). This should be at X1 and X2.
3. With the timer in the "on" mode, or with a jumper shunting the TB2, you should note that the main contactor (K1) will pull in. If K1 does not pull in, there is an "open" in the control circuit. Check out the control circuit fuse (F3). Then check for 120 volts at the K1 coil.

NOTE: It may be necessary to shunt "S2" door switch to complete the control circuit while making voltage checks.

4. With the K1 contactor pulled in, you should obtain 230 volts at T1 and T2, the output of the K1 contactor.
5. Check for 230 volts, before and after the main fuses (F1).
6. Then check for 230 volts at the common of tap switch S1 and the common of TB1.
7. Check for 56 to 98 volts A.C. on the secondary side of the power transformer, while turning the tap switch from 1 to 8.
8. Check for this same voltage at the input (yellow and yellow) of the silicon diode bridge.
9. Check for 40 to 70 volts D.C. on the output of the silicon diode stack. Red is positive, black is negative.
10. Check for 40 to 70 volts D.C. on both sides of the D.C. output fuse (F2). This is a window fuse. You can see if it is blown.
11. Check for this same D.C. voltage at the output terminals.
12. If you have this voltage at the output terminals and you do not draw amperage, under load, you have an "open" in your D.C. output cable leads. Check your connections at both ends of these leads.

MAJESTIC RECTIFIER

OPERATION:

1. ⚠ Never operate the unit with any panel removed when under load.
2. Turn the voltage control counterclockwise (to the left) so that the dial indicator is on the "1" position of the dial plate. This is the setting for the lowest possible output voltage available.
3. After the power supply is installed as above, apply the line voltage to it.
4. Energize the "Timer".
5. Turn the voltage control knob clockwise (to the right) to increase the output voltage.
6. The ammeter and voltmeter will monitor the D.C. output. The ammeter will only read when the load is supplied.

CAUTION: Do not exceed a D.C. output voltage greater than the nameplate rating. Additional voltage is available to compensate for possible low incoming line voltages. Do not change speed while under load.

7. Do not load the unit in excess of the nameplate rating. In the event of an overload, ground or short the load, the D.C. protecting fuse will blow (F2). When this occurs, reduce the D.C. ampere output and/or clear the ground before restarting the power supply.
8. The RED pilot light will indicate POWER ON.
9. REMOTE KILL SWITCH: TB-3 makes provisions for wiring up a remote "KILL SWITCH" at the work area. Opening this remote switch prevents the Power Supply from allowing its output.

MAINTENANCE:

1. Rectifier elements MUST be kept clean to insure proper ventilation. Dirt accumulations will result in improper cooling, causing excessive overheating, which will eventually damage the rectifier elements and other components. We urge cleaning of the power supply every six months, using compressed air or a vacuum cleaner. Do not place objects on top, as they will restrict the air flow and damage components. Fan motors (of ¼ and ⅓ HP) are packed with sufficient grease for approximately five years of operation under normal conditions. After five years, the bearing and housings should be cleaned thoroughly and repacked. Smaller fan motors should be oiled carefully every six months.
2. Inspect all cables, wires and connections for loose connection or overheating. If hot looking spots are found, repair them before they open up, causing serious trouble.
3. Check the calibration of the meters. They should be kept within 2% accuracy of the full scale readings. Watch for sticking of the pointer. See that the pointers are zeroed.
4. In case of blown diodes, the following steps should be taken:
   A. Before replacing the blown diode, the reason or cause of failure should be determined. The diode or diodes in the affected circuit should be isolated (disconnected) electrically from the circuit (disconnect the pig-tail end).
   B. Each diode should then be checked for forward and reverse resistance.

NOTE: If the diode is good, the low resistance reading should be very low, approximately 10 to 20 OHMS. The high resistance would be in the range of 1000 OHMS to 50,000 OHMS. This is variable in diodes. If both readings are high, then the diode should be considered bad and replaced. If no continuity is found, the diode is open and should be replaced.

CAUTION: **NEVER OPERATE THE UNIT WITHOUT THE FAN OR WITH ANY PANEL REMOVED WHEN UNDER LOAD. AFTER UNIT HAS BEEN CLEANED, BE SURE PANELS ARE PUT BACK.**

"AZZURRA CAR"
MAINTENANCE INSTRUCTIONS
BUMPER CARS - MAIN FEATURES

CHASSIS ..... Manufactured with cold formed steel in various sections, bent and welded.
BODY ..... Reinforced fiberglass body shell with molded-in two-tone colors.
SEAT ..... Fiberglass structure covered with hi-density polyurethane foam.
DASHBOARD ... Fiberglass structure covered with hi-density polyurethane foam.
TRIMS ..... Cold formed and/or hand bent stainless steel.
LENS ..... Special plastic safety glass.
TIRE ..... Pneumatic tire with tube all around the chassis. Operative pressure Max 11 kg/cm$_2$ (13-16 P.S.I.)
MOTOR ..... D.C. electric motor operating from 70 up to 115 volt. Clutch and transmission built-in. Operative power 0.78 KW.
SIZE ..... LENGTH ..... 1.940 mm (6'4")
WIDTH ..... 1.220 mm (4'0")
HEIGHT HEADREST ..... 780 mm (2'6")
HEIGHT TOP TROLLEY ROD ..... 2.850 mm (9'4")

MAINTENANCE

NOTE: Use the Majestic Car Parts Manual in conjunction with this section.

The Azzurra Bumper Car has been designed for hard usage and all parts and components have been selected or manufactured to reduce maintenance to a minimum level. In order to obtain the best performance from the car and long life of the various components, we suggest following the maintenance program described in this section.

AFTER INITIAL FEW DAYS OF OPERATION

A. Tighten all electrical connections and nuts, including the lock type.

DAILY MAINTENANCE

A. Check all bulbs. Lights are wired in series so 12 V or 24 V bulbs may be used. If one bulb burns out, all fail. In order to check the location of a burnt out bulb, each headlight is equipped with a warning light and when the light is on, this indicates a burnt out bulb.
B. Clean and spray the external side of the pneumatic tire with silicon spray, available in aerosol cans or spray bottles. This protection avoids damages due to friction of tire against each other or against the bumper rail around the floor. Normal life of the tire is approximately 9 to 10 years with proper care.
C. Clean and spray bumper rail with silicon.

WEEKLY MAINTENANCE

A. Remove the dust which accumulates in the electric motor by blowing out with compressed air, preventing overheating and sparks, between the armature and slip ring.
B. Grease pedal hinge (237) with switch hinge (235).
C. In the pedal unit, check if the bolts (236-238-243) are tightened. A loose connection can produce sparks and failure.
D. Check and maintain penumatic tire (13) pressure at 11 Kg/cm$_2$ (13-16 PSI).
E. Grease the connection between top of trolley pole (290 AB) rod (270 AB) with a vaseline or equal product.

MONTHLY MAINTENANCE

A. Check the diameter of the iron rear wheel (259) and clean it with a steel brush. Never use grinders, files or similar tools as they will damage the wheel roundness.
B. Check the thickness of material in the rear wheel (250 ABCD).
C. Check the thickness of material in the front drive wheel.
D. In the pedal unit, check the copper blocks (239-240) and if needed, smooth with a file. We suggest filing blocks after removal from pedal assembly.
E. Check the thickness of brushes (147) in the double brush holder (126) and clean commutator ring (132) surface with a soft cloth.
F. Check the thickness of brush (131) in the single brush holder (130), four in the new model and two in the old one.

SIX MONTHS MAINTENANCE

These operations can be delayed or advanced according to the total number of rides per car occurring during this period. The maintenance will be carried out between 20,000 and 25,000 rides. An approximate rider capacity per year per car is as follows:

5 min. cycle time ..... 12 riders per hour
8 hours per day ..... 96 riders per day
100 working days ..... 9,600 riders per day

A. Check and grease the ball bearing (252-255) in the rear wheels (250 & 259). Use any type of good grade bearing grease.
B. Check the bearing (113) between the inner housing (114) and outer housing (100) and grease if necessary. Recommended greases are: Vanguard, Likoz, Shell, Alvania 2, Exxon, B P Energrease LS2, or Multipurpose Grease 42.
C. Check and grease the gears (111-215) in the motor housing and steering unit.
D. Check and replace clutch shoes (141-141-A). Later model cars with disc-clutch, normally require disc replacement after 50,000 rides.

ONE YEAR MAINTENANCE

A. Check transmission unit that is assembled co-axially to electric motor and replace the grease inside according to the following procedure:
1. Disassemble the motor from the car.
2. Remove the end block (181).

3. Unscrew bolts (188 B) and remove the reduction unit from the transmission case (177).
4. Detach the transmission unit from the clutch (180).
5. Unscrew the bolts (188-A) and remove the transmission cover (179). Now the reduction unit is open. Remove grease and replace with 150 gr. or 5.2 oz. of new grease. Recommended greases are: Shell, Simnia G, Vanguard, Exxon, and Pen O Led EP 350.
6. Reassemble the unit using opposite procedure, checking carefully the O-ring (189) and washers

B. Check and grease the steering column case (228

TROUBLE CHART

A. Slight nicks in the front trims:
   1. Check the pressure of the tires.

> ⚠ ***CAUTION:*** Over inflation may cause severe bouncing between cars and possible injuries to passengers.

B. If the bumper tire is too close to the floor or drags on the floor:
   1. Check the diameter of iron rear wheel (259).
   2. Check the diameter of rear wheel (250 ABCD).
   3. Check the diameter of front wheel (122 ABCD).
   4. Check the rear shock absorber (251). As a temporary procedure, if awaiting arrival of new wheels, place 4 or 5 washers between parts 114/128/181 on each stud 114 A. This will raise the car higher above the floor.

C. Sparks in the pedal unit:
   1. Check insulator (244) and copper block (239-240). We suggest using two insulators (244) instead of one.

D. The trolley rod is not whipping or whip is too slow:
   1. Check the connection between trolley pole (290-AB) and trolley rod (270 AB). Grease with a vaseline or equal product.

E. Sparks in the trolley rod:
   1. Check the spring (279).
   2. Check the wear of blade (281) or wire contact (276).

F. Trolley rod blade (or wire) break:
   1. Check the gap between the ceiling panels and panel support rafters. Blades or wires may break if caught in this gap.
   2. Lubricate trolley wheel with one drop of lightweight chain oil daily to insure adequate wheel life of approximately 1 season.

> ***NOTE:*** Light sanding of wheel is recommended monthly to minimize oxidation build-up.

G. Hard Steering:
   1. Check and grease bearing (113) between inner housing (114) and outer housing (100).

H. Noise from inner housing:
   1. Check grease in bearing.
   2. Check grease in gear (111-215 AB).
   3. Check shock absorber (112).

J. Steering wheel vibrating:
   1. Check shock absorber (112).
   2. Check nut (210) for tightness.
   3. Check bearing (214 A).
   4. Check nylon bushing (214 B).

K. All cars are not operating:
   1. Check fuse in the transformer.
   2. Check wire connecting floor with the transformer.
   3. Check wire connecting ceiling with the transformer.

L. One car is not operating:
   1. Check brushes (131-147).
   2. Check wire to insulator block.
   3. Check armature (121 AB).
   4. Check fiber insulator plate (133).
   5. Check field coils (119-AB).

M. Noise from the motor:
   1. Check clutch shoes (141).

N. Leakage of grease under motor:
   1. Check the transmission unit washers and replace seals. (Proceed as mentioned in the maintenance for one year).

> ***CAUTION:*** Overfilling will destroy seals. This unit, when empty, requires 150 gr. or 5.2 oz. of grease.

DAILY INSPECTION SCHEDULE

PLEASE PUNCH HERE

	INITIAL APPROPRIATE BLOCK AFTER INSPECTION. DATE: WEEK ENDING ____ MO. ____ DAY ____ YR.	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	COMMENTS
SCOOTER BUILDING	RECTIFIER SPEED SETTING #3								
	ALL FENCE INSTALLED								
	GATES OPERABLE								
	RAMPS AND HINGE PINS INSTALLED								
	RAMP ANTI-SKID								
	RAMP RAILING & SPRING PINS INSTALLED								
	REMOVABLE BUMPER RAIL								
	HYDRAULIC SWITCH OFF								
	FENCE GUARDS INSTALLED (IF APPLICABLE)								
	CONTINUITY								
	CEILING PANELS								
	SAFETY RULES LEDGEABLE								
	SAFETY KEYS								
	EXITS NOT BLOCKED								
BUMPER CAR	SEAT BELTS								
	POLE PAD								
	STINGER HEAD								
	BUMPER TIRE								
	STEERING WHEEL								
	SAVE-A-TOOTH								
	CAR INTERIOR CLEAN								

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BUMPER CAR	SEAT BELTS								
	POLE PAD								
	STINGER HEAD								
	BUMPER TIRE								
	STEERING WHEEL								
	SAVE-A-TOOTH								
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	POLE PAD								
	STINGER HEAD								
	BUMPER TIRE								
	STEERING WHEEL								
	SAVE-A-TOOTH								
	CAR INTERIOR CLEAN								

PLEASE [illegible] HERE

DAILY INSPECTION SCHEDULE

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	CAR INTERIOR CLEAN								

PLEAS JT HERE