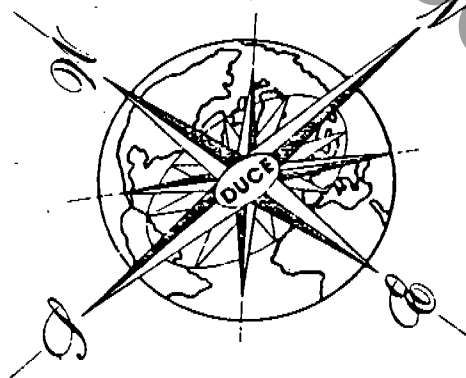


MFG: SDC
NAME: BUMPER CARS
TYPE: NON-KIDDIE



BUMPER CAR

MAINTENANCE INSTRUCTIONS AND PARTS CATALOGUE



Exsaco Corporation

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Telephone: (817) 783-2265 • Telex: 730300

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BUMPER CAR SPECIFICATIONS

	FLOOR PICK-UP	STANDARD
Motor Type	Direct Current	
Voltage Min/Max	35 - 48 Volts DC	80 - 110 Volts DC
Wattage	0.672 Watts	0.736 kw
Amperage	25 Amp Max	14 Amps Max
Horsepower	14 Amp Operating	7 Amps Operating
RPM	.92 HP	1 HP
Speed	261 Max	261 Max
Capacity (Persons)	10.5 FPS Max	10.2 FPS Max
Vehicle Weight	2 Adults	2 Adults
Maximum Load Per Wheel	350 Lbs	350 Lbs
Ride Duration (Suggested)	475 Lbs	475 Lbs
Passenger Restrictions	286 Lbs	286 Lbs
	2 Minutes	2 Minutes
	42 Inches	42 Inches
	Under 7 yrs of age	Under 7 yrs of age -
	accompanied by adult	accompanied by adult

DIMENSIONS

Narrow Body 6'6" Length
 (Cosmo, Comet, Gemini) 3'8" Width
 2'7" to 2'11" Height

Wide Body 6'5" Length
 (Mack I, Mach V) 3'11" Width
 2'7" to 2'11" Height

Manufacturers:

S.D.C., srl
 Via E. Lazzaretti 2/A
 42100 Reggio Emilia, Italy
 522-42346

Barbieri. srl
 Via Cocchi 11
 42100 Reggio Emilia, Italy
 522-511503

U.S.A. Representative:

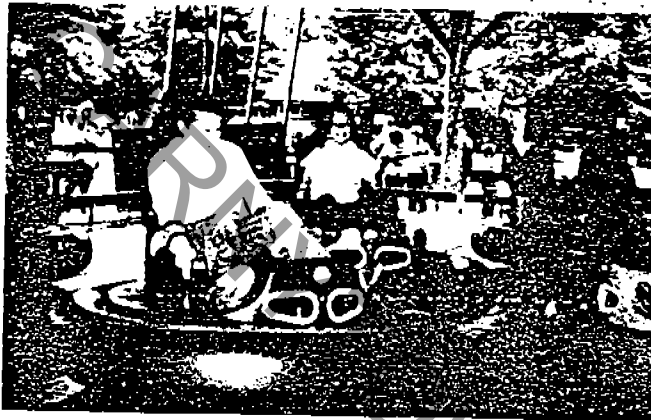
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Amusement Ride Inspection Guide

Bumper Cars, Dodge-Em Cars, Krazy Kars Various Manufacturers

Rate Speed: Approximately 0-6 MPH

Capacity: 1-2 per car



General Information

- Cars are powered by individual 24 volt, DC electric motors. Cars get power through energized steel floor or ceiling.
- Ride operator controls power to ride with transformer switch at control console.
- Riders control direction and speed of cars either through control levers or steering wheel and foot pedal.

Inspection Points

- All cars should be equipped with seat belts to be worn around the trunk so arms can be free.
- Cars with steering wheels must have hub pads.
- Rider size restrictions must be posted and enforced. No pre-school children allowed.
- Unless car is designed for 2 passengers, only one per car should be permitted.
- Spectators must be kept away from bumpers, entrance and exit during ride cycle.
- "ONE WAY" direction of travel is Recommended.
- The electrode post at the rear of the car should be padded.
- No loading or unloading of passengers while floor is energized.

FLOOR PICKUP BUMPER CAR ELECTRICAL OPERATION

Floor pick up bumper cars operate by receiving current from (+) and (-) energized floor plates, which are arranged on the floor in rows connected to a low voltage (maximum 48 volts DC) power supply. The floor plates are spaced apart with a plastic insulator between each row.

There are four (4) pick up contacts located underneath the car which are so placed that at any one time the pick up point will be in contact with two (2) different polarity floor plates. The current is then directed via rectifier to the positive and negative supply wires of the bumper car motor. The control of the motor is accomplished through a mechanical foot switch, which, when closed, allows the current to travel to the motor therefore allowing the car to operate.

STANDARD BUMPER CAR ELECTRICAL OPERATION:

Standard Bumper Cars operate by receiving current (80-110 DC) from energized ceiling panels usually mounted 8'-9' above a steel on aluminum floor. The current is picked up through a wiper assembly mounted on an insulated pole. This pole is then electrically connected to a mechanical foot switch which when pressed by rider it allows current to be supplied to motor which allows the car to operate.

RECOMMENDED OPERATION OF BUMPER CARS

I. Number of Operators

Bumper cars are normally operated with one (1) person who has access to controls, entrance gates, and exit gates at all times. It may become necessary in certain instances to add extra personnel to assist with the operation of the ride during times of high usage in order to safely control traffic flow.

II. Safety Equipment

1. Safety Shoulder Straps - Each bumper car is supplied with two (2) shoulder straps. It is mandatory that a shoulder strap be worn by each rider during the duration of the ride. The shoulder straps are worn by inserting one arm through loop and allowing the strap to rest on the patron's shoulder. Failure to comply with these instructions could cause possible injury to the riders.
2. Cushioned Steering Wheel - This cushion, which is located in the center of the steering wheel, is mandatory. No bumper car should be allowed

to operate without one.

3. Cushioned Trolley Pole - (Standard model cars only). - This cushion is required on all standard model bumper cars with trolley poles. This cushion is designed to absorb shock in the event that a rider's head comes in contact with the trolley pole.
4. Headrest Cushion (Certain models) - Provides protection for rider's head and neck areas.
5. Dash Pad - This cushion is required along the front edge of the bumper cars seating compartment in order to provide protection for legs and knees.
6. Padded Seats - The padded seat is provided for passengers comfort. It is not recommended to replace this seat with a hard surface material (fiberglass, plastic, etc.).

III. Rider Instructions

The following instructions should be mounted in a place that is easily readable by all potential riders. These instructions must be strictly enforced.

1. No food or drinks allowed on ride.
2. Shoes must be worn at all times.
3. No riders under 42 inches permitted. *Should be 48" at quarter race*
4. Children under the age of 7 years must be accompanied by an adult.
5. No head-on bumping allowed.
6. All riders must wear shoulder straps at all times.
7. Limit 2 riders per car.
8. No running on floor at any time.
9. Remove all loose articles before entering ride.
10. No pregnant women
11. No rider with history of neck or back injury.

IV. Large Floors

When floors exceed 40 feet in continuous length, it is recommended that signs be posted to indicate the riders should operate the cars in one circular direction around the floor. This is to discourage excessive speed and long run intentional head-on bumping.

OPERATION OF RIDE

(Also refer to Rider Instructions)

- I. Before operating any ride cycle, operator must be aware of the following:
 1. All riders are seated.
 2. All riders have shoulder straps in place.
 3. No patrons standing on floor.
 4. Both entrance and exit gates must be closed with patrons behind gates.
- II. Adjust timer for desired length of ride.
- III. Start ride.
- IV. Monitoring of ride

During operation of ride, observe riders. If anyone is acting in an unsafe manner, stop the ride, warn rider. Restart ride. If problem persists, stop ride and request patron to leave ride.

If a situation arises, such as patron leaves car during operation, a spectator climbs over the fence, loose articles are found on the floor, etc., **STOP RIDE IMMEDIATELY**. Do not start ride again until situation has been corrected.

In the instance of a "jam up", stop ride, manually push cars free, then restart ride.
- V. End of Ride

When ride time elapses and cars stop moving, allow the riders to exit the floor completely and close exit gates before allowing new riders to enter the ride.

DAILY OPERATOR MAINTENANCE AND INSPECTIONS

The inspections and maintenance points listed below are to be completed daily by the person(s) responsible for the operation of the ride with patrons. It should be understood that these inspections should be done in conjunction with those outlined in the maintenance manual.

I. Inspections

1. * Check floor for any large objects that could cause damage to the cars or injury to patrons.

2. * Check all cars and make certain all safety equipment is installed and in proper working condition.
3. * Check floor plating for any screws that are loose or missing.
4. Check operation of controls and emergency stop.
5. Check condition of entrance and exit gates.
6. * Report any problems or questions to proper personnel.

* To be monitored continually during the operating day.

II. Daily Operational Maintenance

1. Sweep floor at least two (2) times per day with a dust mop or equivalent (more if necessary).
2. Paint talc on bumper tires, as described in Operation Manual, every two (2) days.
3. Clean walkway, entrance way, and operation area.
4. Operator should report any problems or questions to proper personnel.
5. Clean cars and seats.

RIDE MAINTENANCE AND INSPECTIONS

The inspections and maintenance points listed below are to be completed daily by the person(s) responsible for maintenance of the ride.

I. Daily Maintenance and Inspections

1. Check operation of each car.
2. Check all bolts, wires, motor, etc, for security.
3. Check all safety equipment on cars.
4. Inspect floor, bump rail, electrical service for any damage or abnormal conditions.
5. Check operation of entire system.
6. Inspect fiberglass body and repair if necessary.

II. Weekly Inspections and Maintenance

1. Lubricate switch pedal with silicon base lubricant.
2. Check wear on contact points (pick up style only). Replace contact when worn down flush with holder.
3. Check condition of contact spring.
4. Check condition of rubber wheel(s) 1/4" rim thickness of rubber.
5. Check seats, fiberglass, body, bumper tube, frame for unusual conditions or damage.

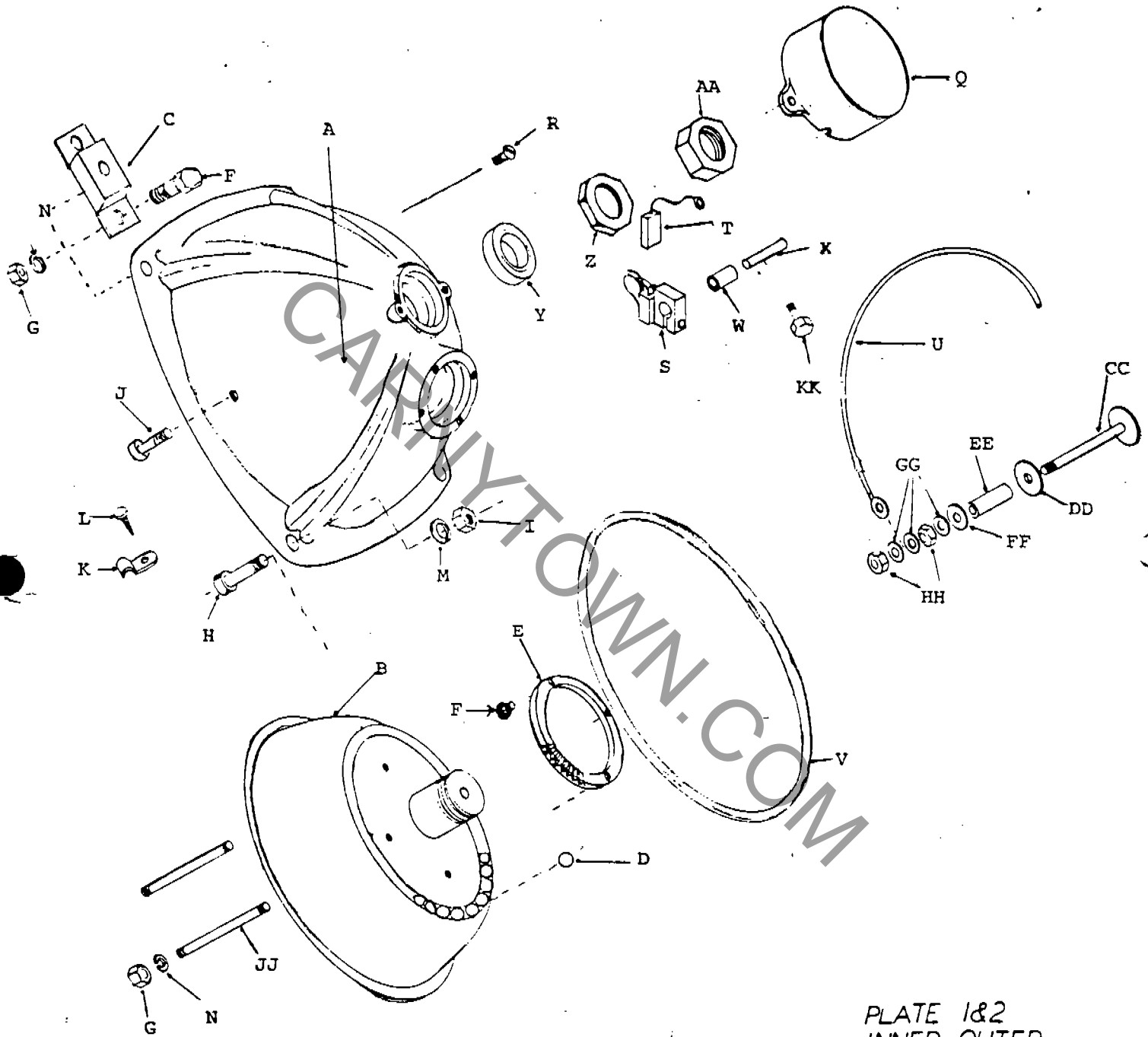
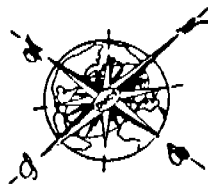


PLATE 1&2
INNER-OUTER
HOUSING



Exsaco Corporation

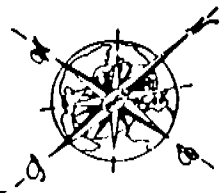
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PLATE 1 - INNER AND OUTER HOUSING DETAILS

INDEX NO.	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
A	SBC1010	Outer Housing	1
B	SBC1020	Inner Housing (includes #2200 studs)	1
C	SBC1030	Mounting Block (Rubber)	4
D	SBC1040	Ball Bearings (Set of 72)	1
E	SBC1050	Steering Ring Gear	1
F	SBC1070	Hex Bolt	8
G	SBC1090	Hex Lock Nut (use with 1070/2200)	12
H	SBC1100	Allen Head Bolt (mounts 1010 to 1030)	4
I	SBC1110	Hex Lock Nut (use with 1100)	4
J	SBC1120	Hex Bolt, Grounding	1
K	SBC1130	Wire Clamp (holds 2050 in place)	2
L	SBC1140	Drive-type Screw (mounts 1130)	2
M	SBC1150	Lock Washer (use with 1100/1110)	4
N	SBC1160	Lock Washer (use with 1070/1090/2200)	12

PLATE 2 - COMMUTATOR DETAILS

	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
P	SBC2000	Commutator, Complete (incl. 2010/2030/2040/2070/2080/2210)	1
Q	SBC2010	Commutator Housing	1
R	SBC2020	Machine Screw (use with 2010/1010)	2
S	SBC2030	Single Brush Holder	1
T	SBC2040	Carbon Brush with Wire	1
U	SBC2050	Power Wire (use with 2000/2120)	1
V	SBC2060	Dust Shield	1
W	SBC2070	Insulator Tube	1
X	SBC2080	Rod Support	1
Y	SBC2090	Bearing	1
Z	SBC2100	Hex Nut	1
AA	SBC2110	Jamb Nut	1
BB	SBC2120	Contact Assy., Complete (includes 2130/2140/2150/2160/2170/2180)	1
CC	SBC2130	Commutator Bolt, Brasshead	1
DD	SBC2140	Insulator Washer, Large	1
EE	SBC2150	Insulator Tube	1
FF	SBC2160	Insulator Washer, Small	1
GG	SBC2170	Flat Washer	3
HH	SBC2180	Hex Nut	2
II	SBC1090	Hex Lock Nut (use with 2200)	4
JJ	SBC2200	Stud, Modified for Replacement (use with 1020)	4
KK	SBC2210	Hex Bolt (use with 2010/2080)	1
LL	SBC1160	Lock Washer (use with 2200)	4

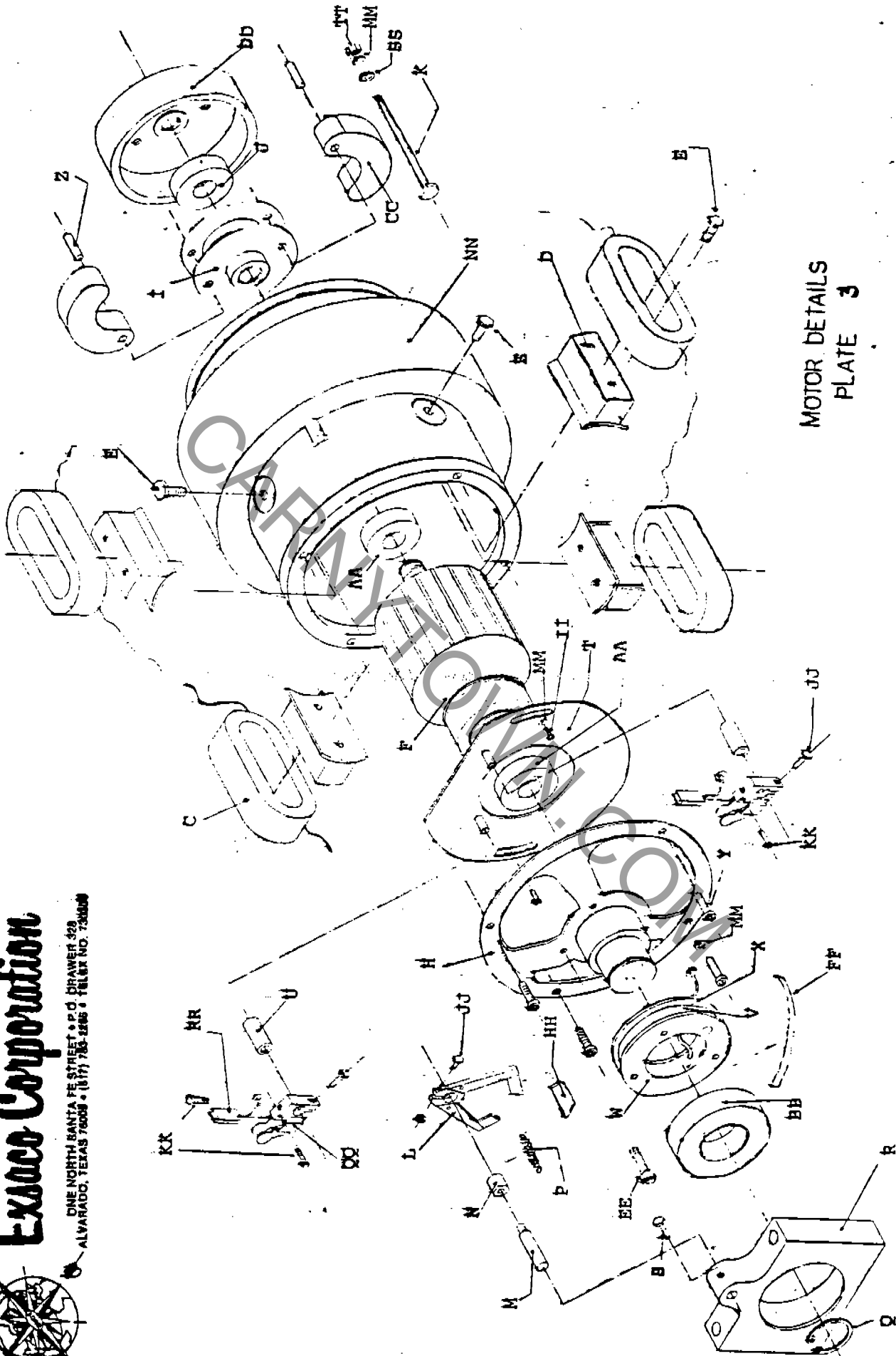


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MOTOR DETAILS
PLATE 3

PLATE 3 - MOTOR DETAILS

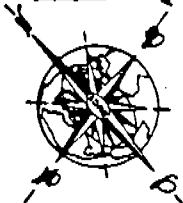
INDEX NO.	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
A	SBC3010	Drive Unit, Complete (includes 3500/3170/4230/4010) [Motor]	1
B	SBC3015	Drive Unit, Complete, rebuilt (when available)	1
C	SBC3020	Field Coils (4 connected)	1
D	SBC3030	Laminated Block	4
E	SBC3040	Hex Bolt (use with 3030)	8
F	SBC3070	Armature	1
G	SBC3075	Armature, Rebuilt (when available)	1
H	SBC3080	Bell Housing	1
I	SBC3090	Clutch Shoe Holder	1
J	SBC3100	Bearing (use with 3090)	1
K	SBC3110	Wheel Bolt	4
L	SBC3120	Double Brush Holder (uses brush 3390)	1
M	SBC3130	Stud (use with 3120)	1
N	SBC3140	Insulator	1
P	SBC3150	Spring (use with 3120)	2
Q	SBC3160	Snap Ring, Expansion (use with 3170)	1
R	SBC3170	Motor Mounting Block (use with 3080/2200/1020)	1
S	SBC3180	Hex Bolt (use with 3170/3130)	1
T	SBC3190	Brush Plate Mounting (use with 2030)	1
U	SBC3200	Insulator (use with 3190/2030)	2
V	SBC3240	Commutator Ring	1
W	SBC3250	Insulator, with 4 holes	1
X	SBC3260	Insulator, with 3 holes	1
Y	SBC3270	Allen Bolt	4
Z	SBC3280	Clutch Shoe Retaining Pin (use with 3090/3330)	2
AA	SBC3300	Bearing, Sealed (use with 3070)	2
BB	SBC3310	Bearing, Sealed (use with 3170/3080)	1
CC	SBC3330	Clutch Shoe (use pin 3280)	2
DD	SBC3350	Flywheel, Clutch	1
EE	SBC3360	Machine Screw (for slip ring assembly)	3
FF	SBC3370	Insulator (used between 3260 and 3080)	1
GG	SBC3380	Clutch Shoe Assy. (includes 1-3090/2-3280/2-3330)	1
HH	SBC3390	Carbon Brush (use with 3120)	2
II	SBC3400	Machine Screw (for brush plate)	2
JJ	SBC3410	Bolt (use with 2030/3120)	3
KK	SBC3420	Bolt (use with 2030)	2
LL	SBC3430	Nut	2
MM	SBC3440	Lock Washer	2
NN	SBC3500	Drive Wheel	1
PP	SBC3505	Drive Wheel, Retread (when available)	1
QQ	SBC2030	Single Brush Holder (uses brush 2040)	2
RR	SBC2040	Carbon Brush with Wire (use with 2030)	2
SS	SBC2170	Flat Washer	4
TT	SBC2180	Hex Nut	4
UU	SBC3750	Motor Brush Kit (includes 2-2030/2-2040/1-3120/1-3140/ 2-3200/2-3390/1-3130)	1

NOTE: Trade in allowance is given on used motors, if complete.



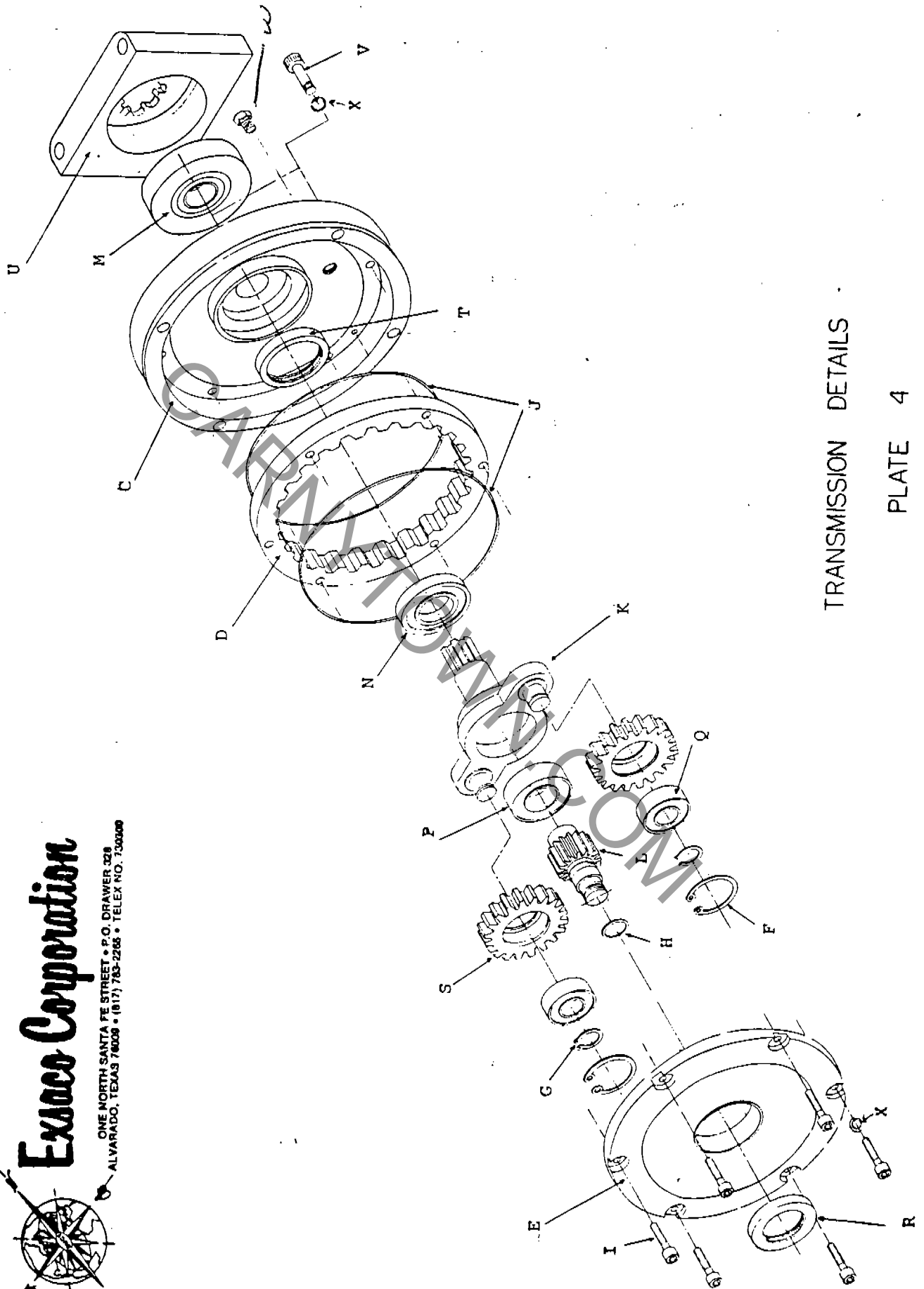
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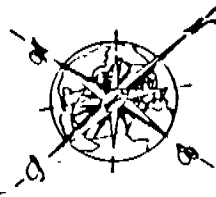
TRANSMISSION DETAILS

PLATE 4

PLATE 4 - TRANSMISSION DETAILS

INDEX NO.	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
A	SBC4010	Transmission assy., Complete (includes 3350)	1
B	SBC4015	Transmission Assy., Complete, rebuilt (when available)	1
C	SBC4020	Transmission Case	1
D	SBC4030	Ring Gear	1
E	SBC4040	Transmission Cover	1
F	SBC4080	Snap Ring, Expansion, Large (use with 4210)	2
G	SBC4090	Snap Ring, Compression, Small (use with 4130)	2
H	SBC4100	"O" Ring Seal, Small (use with 4140)	1
I	SBC4110	Allen Bolt (use with 4020/4040)	6
J	SBC4120	"O" Ring Seal, Large (use with 4030/4040/4020)	2
K	SBC4130	Mounting Gear (use with 4210)	1
L	SBC4140	Spur Gear	1
M	SBC3310	Bearing, Sealed (use with 4230)	1
N	SBC4160	Bearing, Open (use with 4130)	1
P	SBC4170	Bearing, Sealed (use with 4130/4140)	1
Q	SBC4180	Bearing, Sealed (use with 4210)	2
R	SBC4200	Grease Seal, Small (use with 4040)	1
S	SBC4210	Intermediate Gear	2
T	SBC4220	Grease Seal, Large (use with 4020)	1
U	SBC4230	Transmission End Block	1
V	SBC4240	Allen Bolt	4
W	SBC4250	Plug, Hex, Inspection (use with 4020)	2
X	SBC3440	Lock Washer (use with 4240/4110)	10
Y	SBC4750	Seal Kit (includes 1-4100/2-4120/1-4200/1-4220)	1

NOTE: Trade in allowance is given on used transmission assembly, if complete.



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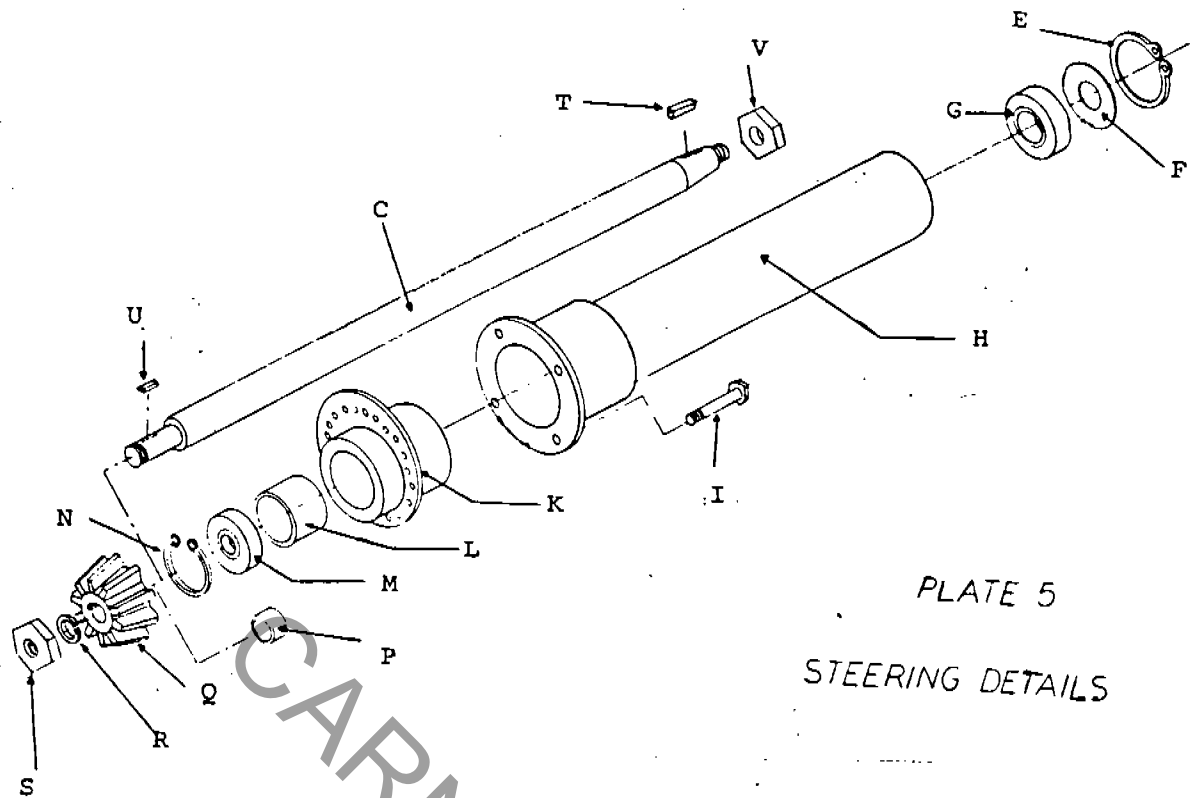


PLATE 5

STEERING DETAILS



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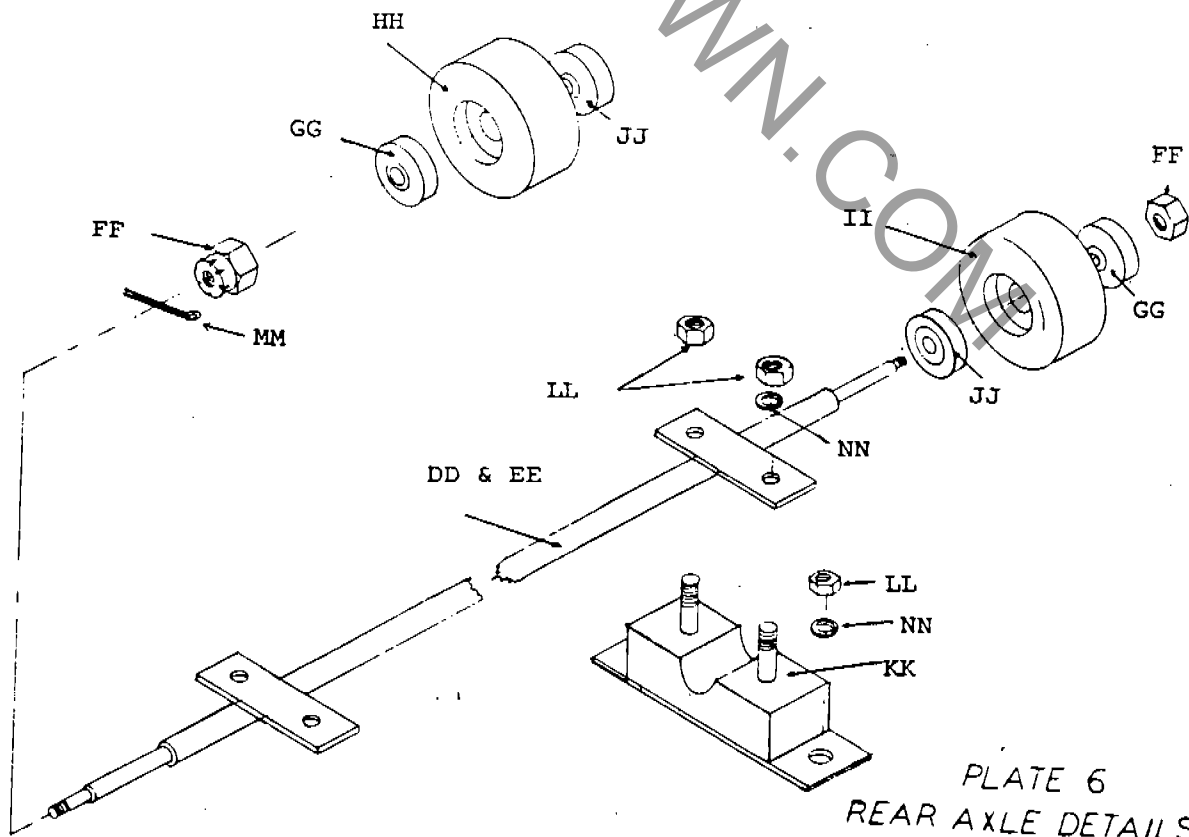


PLATE 6
REAR AXLE DETAILS

PLATE 5 - STEERING DETAILS

INDEX NO.	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
A	SBC5010	Steering Assy. Column, Complete and ready to attach to 1010 (less steering wheel)	1
B	SBC5015	Steering Assembly Offset	1
C	SBC5020	Steering Shaft - long or short	1
D	SBC5025	Steering Shaft Offset	1
E	SBC5030	Snap Ring, Expansion	1
F	SBC5040	Dust Shield	1
G	SBC5050	Bearing	1
H	SBC5060	Steering Column Case	1
I	SBC5070	Hex Bolt (use with 5060/1010)	4
J	SBC1160	Lock Washer	4
K	SBC5080	Gear Adjuster	1
L	SBC5090	Spacer Sleeve, Large	1
M	SBC5100	Bearing, Sealed	1
N	SBC5110	Snap Ring, Expansion	1
P	SBC5120	Spacer Sleeve, Small	1
Q	SBC5130	Bevel Gear	1
R	SBC5140	Lock Washer	1
S	SBC5150	Hex Nut	1
T	SBC5160	Key, Upper	1
U	SBC5170	Key, Lower	1
V	SBC5180	Hex Nut, Steering Wheel	1
W	SBC5190	Steering Column (Short-Daytona/Espada)	1
X	SBC5200	Adapter Flange for 5510	1
Y	SBC5210	Screws for Attaching Adapter	6
Z	SBC5220	Adapter Bolt for Attaching Safety Cushion to 5510	1
AA	SBC5250	Steering Wheel Cushion for 5510	1
BB	SBC5510	Steering Wheel, New Style	1
CC	SBC5520	Steering Wheel Cushion Assembly (includes 5510/5200/5210/5220/5250)	1

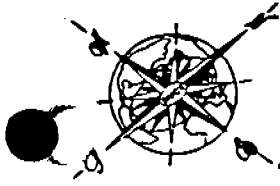
PLATE 6 - AXLE DETAILS

	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
DD	SBC6010	Rear Axle (for Cosmo, Comet and Gemini - 31" long)	1
EE	SBC6015	Rear Axle (for Mach 1 - wide body - 33" long)	1
FF	SBC6020	Castle Nut	2
GG	SBC3300	Bearing, Sealed	2
HH	SBC6050	Iron Rear Wheel	1
II	SBC6060	Rubber Rear Wheel	1
JJ	SBC6070	Bearing, Sealed	2
KK	SBC6090	Pillow Block	1
LL	SBC1090	Hex Nut (use w/6090 to fasten to frame)	4
MM	SBC6110	Cotter Pin	2
NN	SBC1160	Lock Washer (use with 6090/1090)	4



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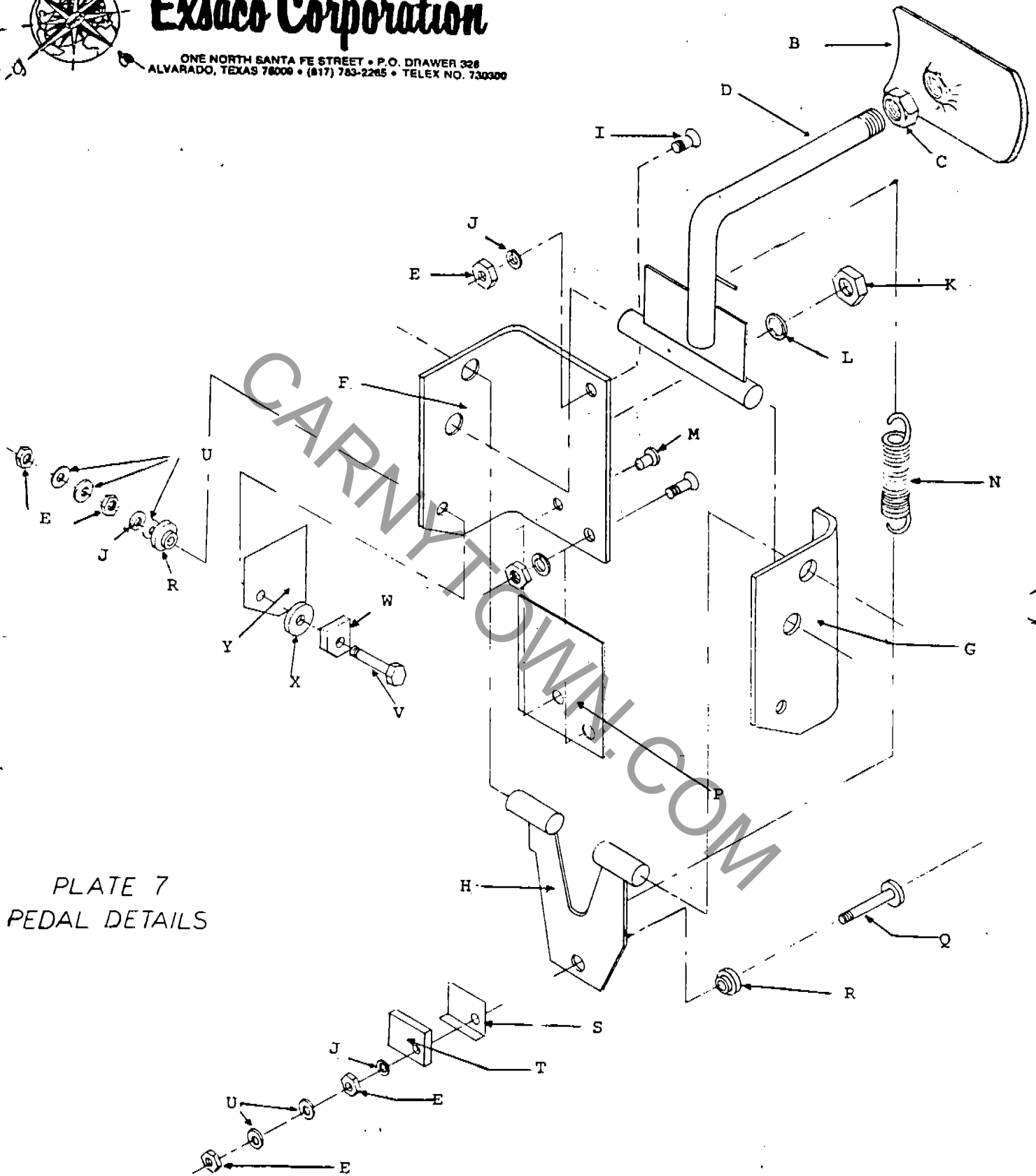
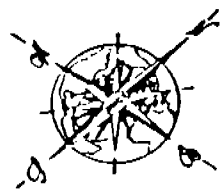


PLATE 7
PEDAL DETAILS

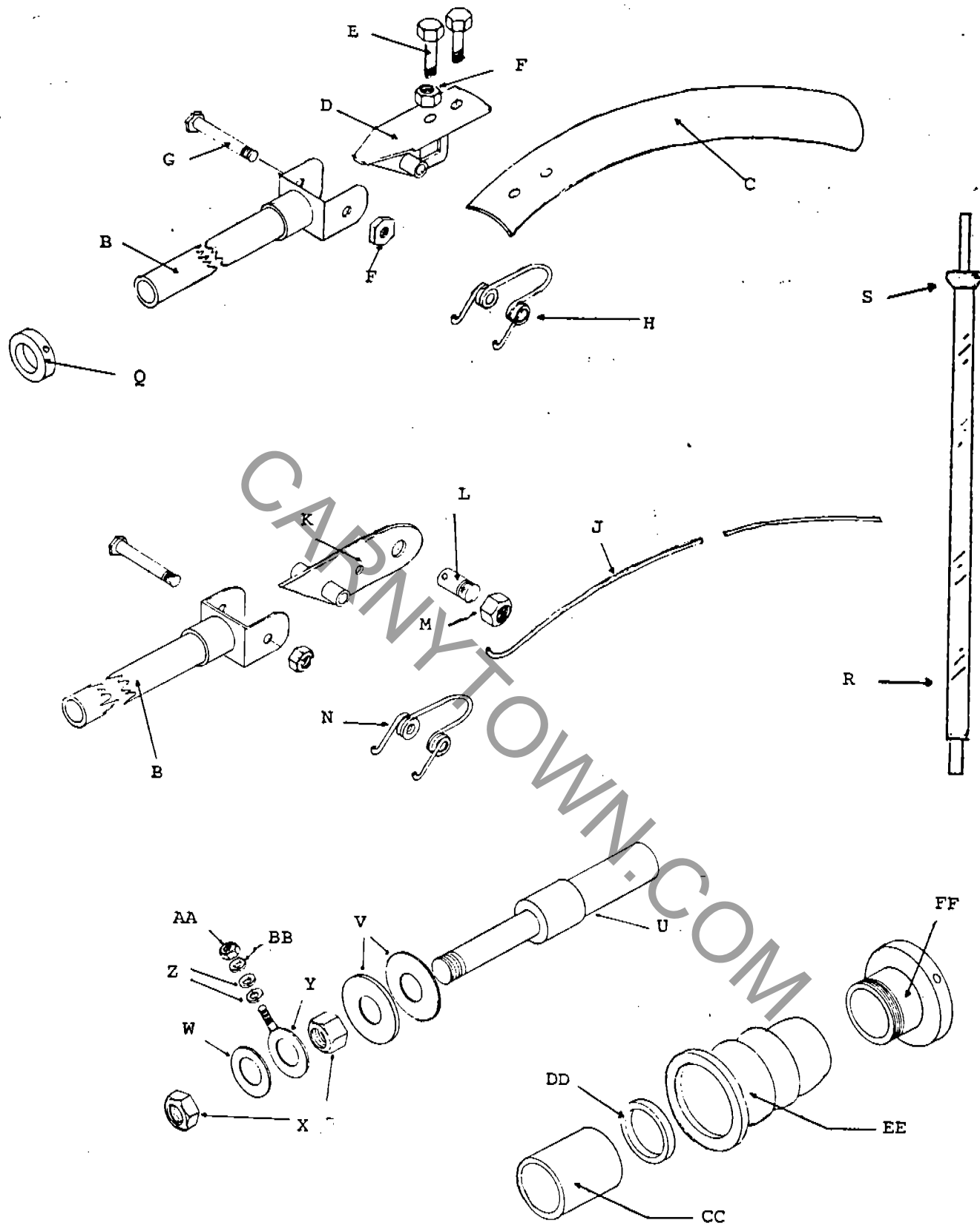
PLATE 7 - SWITCH PEDAL DETAILS

INDEX NO.	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
A	SBC7010	Switch Pedal, Complete	1
B	SBC7030	Foot Pad	1
C	SBC7050	Jamb Nut	1
D	SBC7060	Hinge, Pedal	1
E	SBC2180	Hex Nut	6
F	SBC7070	Bracket, Large	1
G	SBC7080	Bracket, Small	1
H	SBC7090	Hinge, Switch	1
I	SBC7110	Machine Screw	2
J	SBC3440	Lock Washer	4
K	SBC1090	Hex Nut (locks pedal to car floor)	1
L	SBC1160	Lock Washer (use with 1090)	1
M	SBC7150	Rubber Bumper	1
N	SBC7160	Extension Spring	1
P	SBC7170	Flat Insulator, with 2 holes	1
Q	SBC7180	Round Headed Bolt	1
R	SBC7190	Fiber Washer, with shoulder	2
S	SBC7200	Fiber Insulator	2
T	SBC7210	Large Copper Block	1
U	SBC2170	Flat Washer	6
V	SBC7230	Hex Bolt	1
W	SBC7240	Small Copper Block	1
X	SBC7250	Fiber Washer	1
Y	SBC7260	Insulator, with cut corner	1
Z	SBC7500	Pedal Rebuilding Kit (includes: 5-2170/1-7160/1-7210 6-2180/1-7170/1-7230/4-3440/1-7180/1-7240/2-7110/ 2-7190/1-7250/1-7150/1-7200/1-7260)	1



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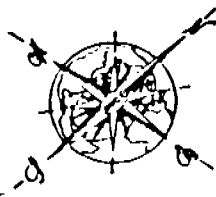
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PLATE 8
 TROLLEY DETAILS

PLATE 8 - TROLLEY DETAILS

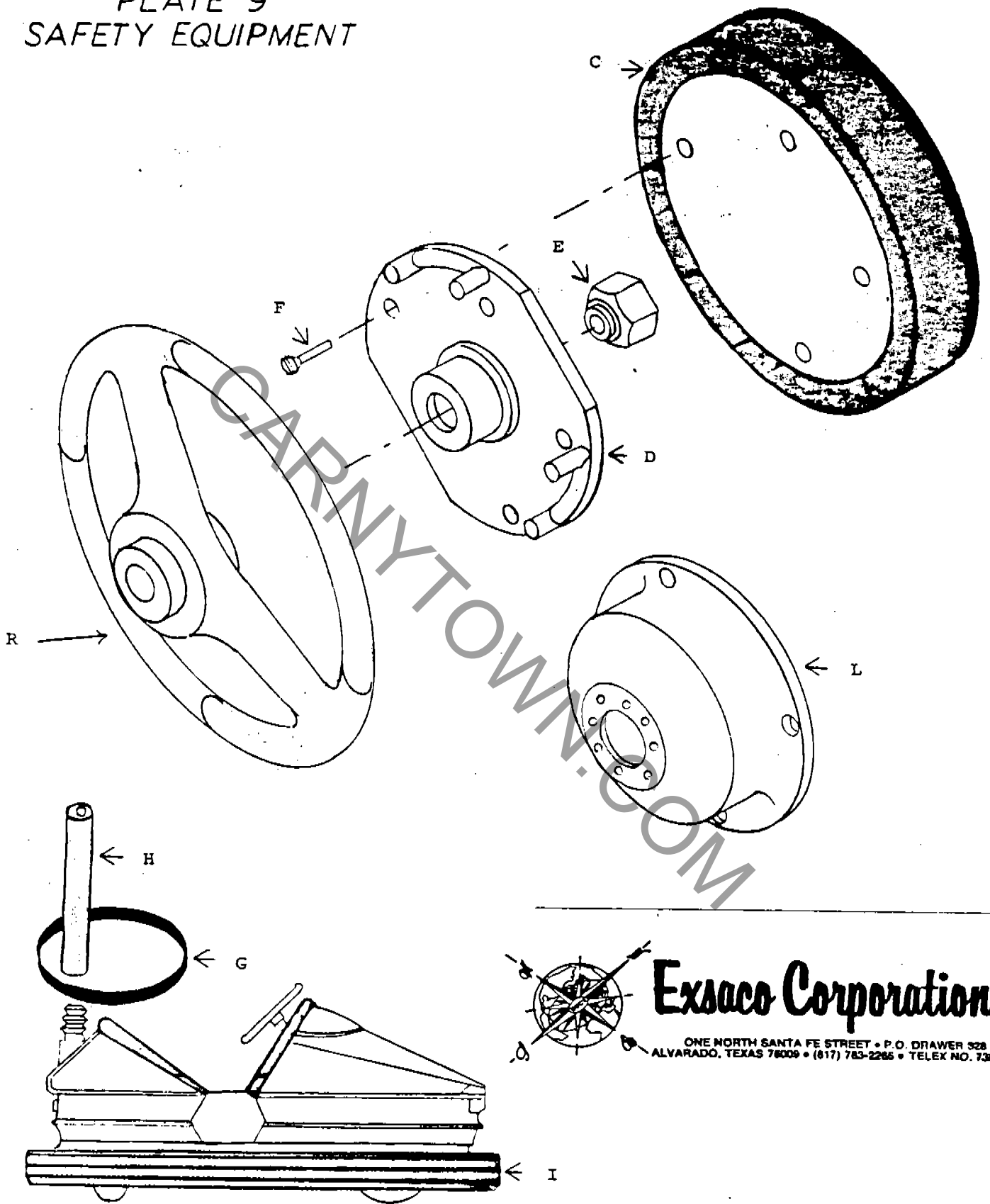
INDEX NO.	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
A	SBC8000	Wide Wiper Blade Assembly, Complete (includes 8010/8020/8030/8040/8050/8060/8080/8300)	1
B	SBC8010	Trolley Rod End (use on all applications)	1
C	SBC8020	Wide Wiper Blade	1
D	SBC8030	Connecting Bracket (for attaching wide wiper blade)	1
E	SBC8040	Hex Bolt	2
F	SBC8050	Hex Nut (use with 8040/8060)	3
G	SBC8060	Hex Bolt (use with 8010)	1
H	SBC8080	Trolley Spring (use with 8030/8020)	1
I	SBC8200	Wire Wiper Assembly, Complete (includes 8010/8060/8210/8230/8300/8220/8270/1090)	1
J	SBC8210	Wire Wiper	1
K	SBC8220	Connecting Bracket (for wire wiper)	1
L	SBC8230	Headless Bolt	1
M	SBC1090	Hex Nut (use with 8230)	1
N	SBC8270	Trolley Spring (for wire wiper only)	1
P	SBC8290	Insulator Block (use with 8510) [not shown] Plastic	1
Q	SBC8300	Set Collar (use with 8010)	1
R	SBC8400	Trolley Pole, Complete	1
S	SBC8420	Chrome Cap (for trolley pole)	1
T	SBC8500	Trolley Rod Joint, Complete Assembly (includes 8510/8550/7050/8570/8600)	1
U	SBC8510	Trolley Rod Joint	1
V	SBC8550	Flat Washer	2
W	SBC8570	Flat Washer	1
X	SBC7050	Hex Nut (use with 8510)	2
Y	SBC8600	Washer, with Electric Stud Terminal	1
Z	SBC2170	Flat Washer	2
AA	SBC2180	Hex Nut	1
BB	SBC3440	Lock Washer	1
CC	SBC8750	Compression Sleeve, Rubber	1
DD	SBC8760	Compression Ring	1
EE	SBC8770	Rubber Flange	1
FF	SBC8780	Rail Fitting (all cars)	1
GG	SBC8060	Hex Bolt (holds 8290 to car)	1
HH	SBC8900	Aluminum Roller Wheel Assembly (includes 8910/8920/8930/1090)	1
II	SBC8910	Aluminum Wheel	1
JJ	SBC8920	Roller Wheel Bracket	1
KK	SBC8930	Grease Bolt for Roller Wheel	1
LL	SBC1090	Hex Nut (use with 8930)	1



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PLATE 9
SAFETY EQUIPMENT



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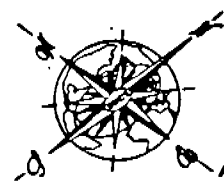
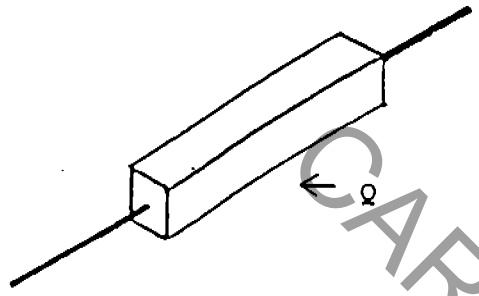
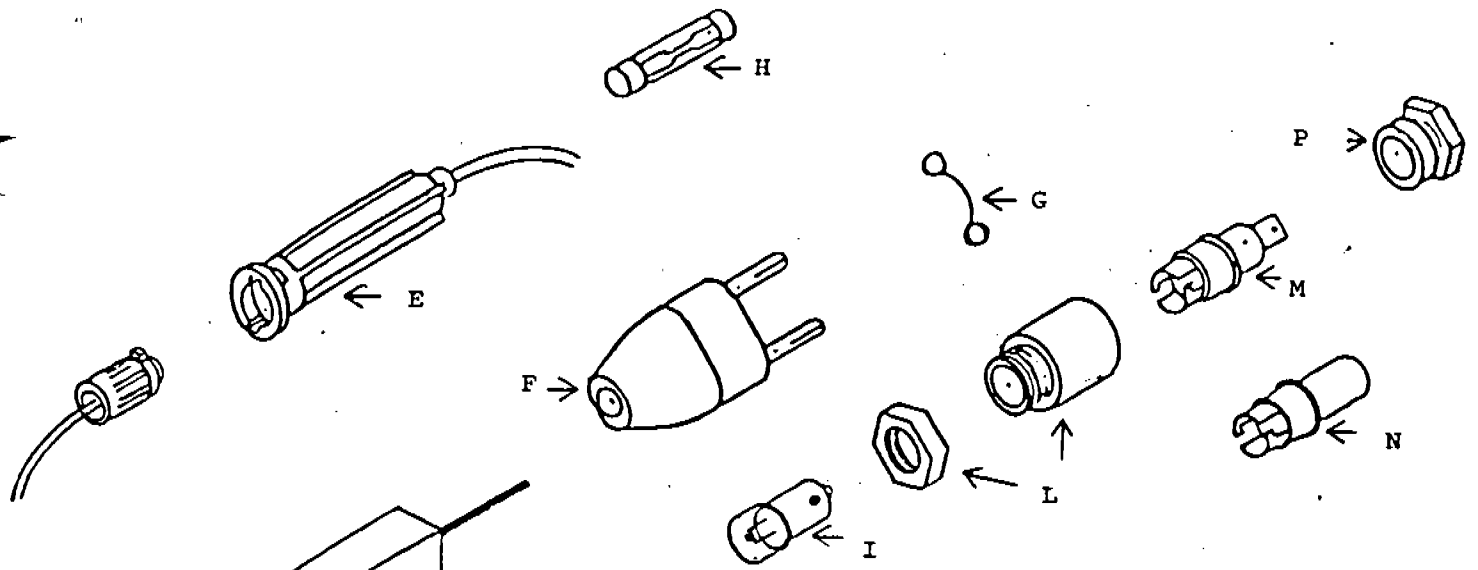
PLATE 9 - SAFETY EQUIPMENT

INDEX NO.	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
A	SBC9000	Safety Kit, Complete (includes 9020/9030/9040/4-9050/9060/9080) [a 1018 wrench is needed per order]	1
B	SBC9010	Steering Wheel Cushion Kit (includes 9020/9030/9040/4-9050) [a 1018 wrench is needed per order]	1
C	SBC9020	Steering Wheel Pad (only)	1
D	SBC9030	Mounting Bracket (for steering wheel pad 9020)	1
E	SBC9040	Nut, Special (for steering wheel mounting bracket 9030)	1
F	SBC9050	Machine Screws (for mounting 9020 to 9030)	4
G	SBC9060	Seat Belt - Mach 1, Cosmo, Comet	2
H	SBC9080	Pole Cushion	1
I	SBC9100	Bumper Tire - Mach 1, Cosmo, Comet	1
J	SBC9110	Bumper Tire - Dune Buggy	1
K	SBC9120	Bumper Tube (all types)	1
L	SBC9140	Mounting Bracket (fiber glass) [Discontinued]	1
M	SBC5200	Adapter Flange for 5510	1
N	SBC5210	Screws for Attaching Adapter	6
P	SBC5220	Adapter Bolt for Attaching Safety Cushion to 5510	1
Q	SBC5250	Steering Wheel Cushion for 5510	1
R	SBC5510	Steering Wheel, New Style	1
S	SBC5520	Steering Wheel Cushion Assembly (includes 5510/5200/5210/5220/5250)	1



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PLATE 9A

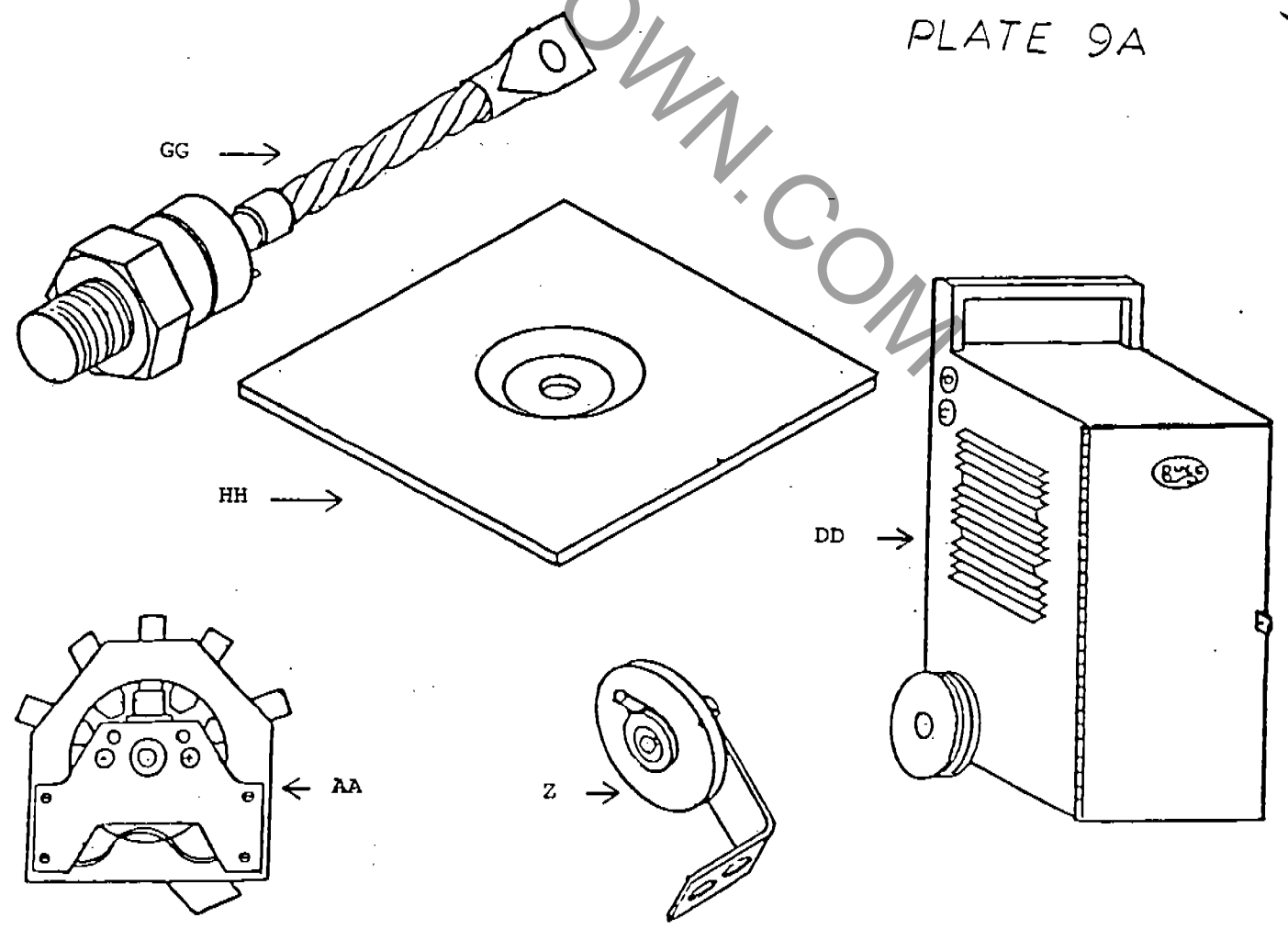
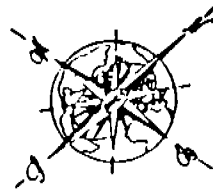


PLATE 9A - ACCESSORIES

INDEX NO.	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
A	SBC9150	Talc for lubricating bumper tires (25 lb. drum)	.
B	SBC9160	New Fuse Holder for New Cars	1
C	SBC9170	New Fuse	1
D	SBC9180	New Fuse Holder Assembly (includes - 9160/9170)	1
E	SBC9190	Fuse Holder, inline (motor)	1
F	SBC9200	Fuse, Complete (for lights)	1
G	SBC9210	Fuse Wire (for 9200)	1
H	SBC9220	Fuse, 20 amp (for 9190)	1
I	*SBC9230	Light Bulb (12 volt, 3 watt)	8
J	*SBC9235	Light Bulb (24 volt)	4
K	SBC9240	Wire, flexible (per foot)	
L	SBC9270	Light Socket, base only	4
M	SBC9280	Bulb Holder, tab type	4
N	SBC9285	Bulb Holder, pin socket type	4
P	SBC9290	Locking Nut (for light socket)	1
Q	SBC9300	Resistor (for lights on Cosmo and Mach 1)	1
R	SBC9310	Terminal Connector for 1/4" stud (crimp type)	
S	SBC9320	Terminal Connector for 3/16" stud (crimp type)	
T	SBC9330	Terminal Connector (crimp type), Spade [female]	
U	SBC9340	Butt Connector	
V	SBC9350	Steering Wheel Button	1
W	SBC9360	Terminal Connector (crimp type), Pin [male] use w/9285	
X	SBC9370	Transformer - 20 KVA for converter only (single-phase 208-230 volt AC, 70-110 volt DC)	1
Y	SBC9380	Transformer - 30 KVA for converter only (single-phase 208-230 volt AC, 70-110 volt DC)	1
Z	SBC9390	Resistor, Thyrite (for converter)	1
AA	SBC940	Selector Switch (for all types converter)	1
BB	SBC9410	Oval Emblem - "Duce, Mark of Excellence"	1
CC	SBC9420	Emblem - "Duce, Made in Italy"	1
DD	SBC9430	Converter - 20 KVA, Complete (220 volt AC, single-phase 70-110 volt DC)	1
EE	SBC9435	Rebuilt Converter - 20 KVA, Complete (with trade-in only and when available)	1
FF	SBC9440	Converter with Remote Control - 20 KVA (220 volt AC, single-phase, 70-110 volt DC)	1
GG	SBC9500	Diode for Duce Converter (all sizes) incl. nut/washer	1
HH	SBC9510	Heat Sink Plate for Converter (all sizes)	1

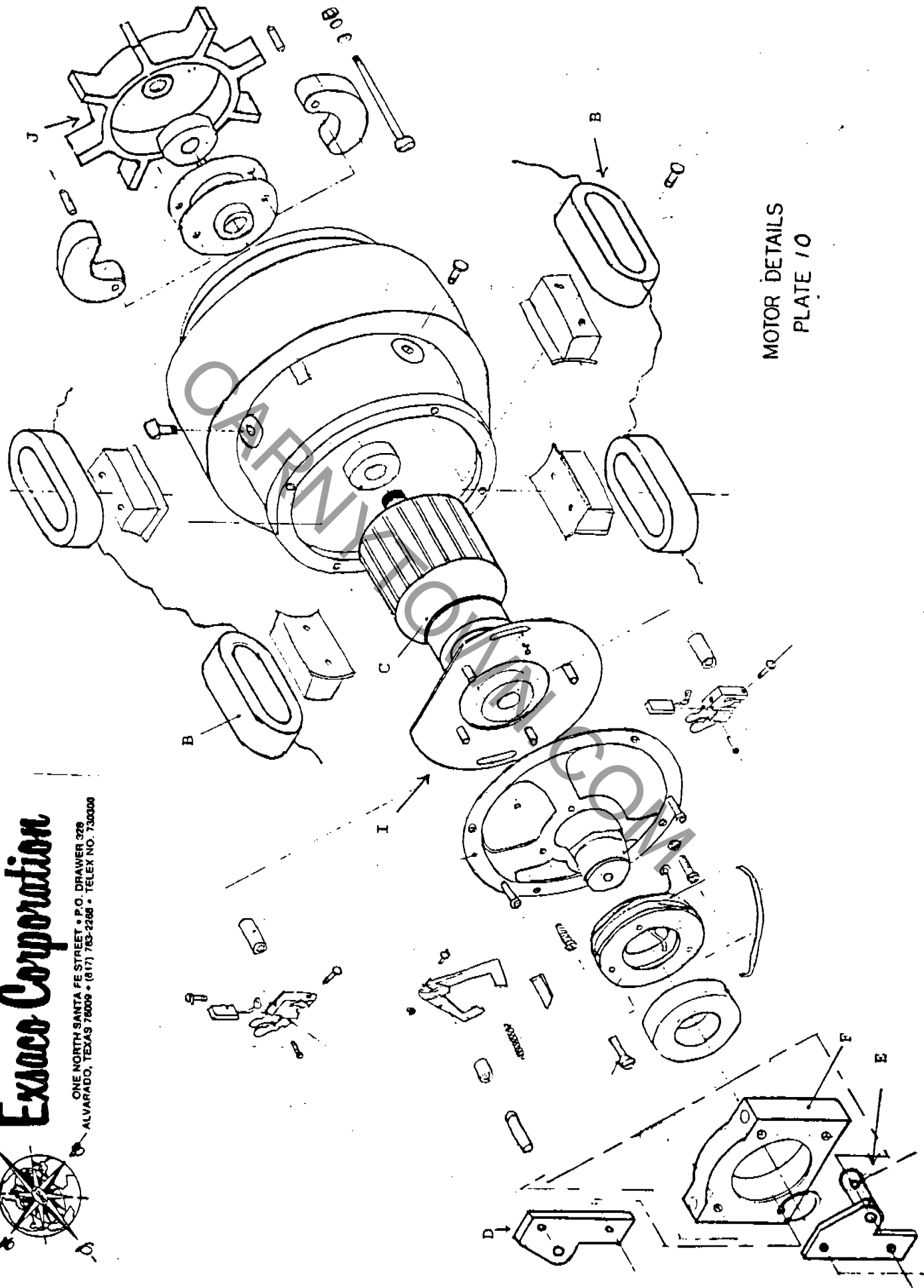
*If other type of bulb is required, please specify when ordering.



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MOTOR DETAILS
PLATE 10



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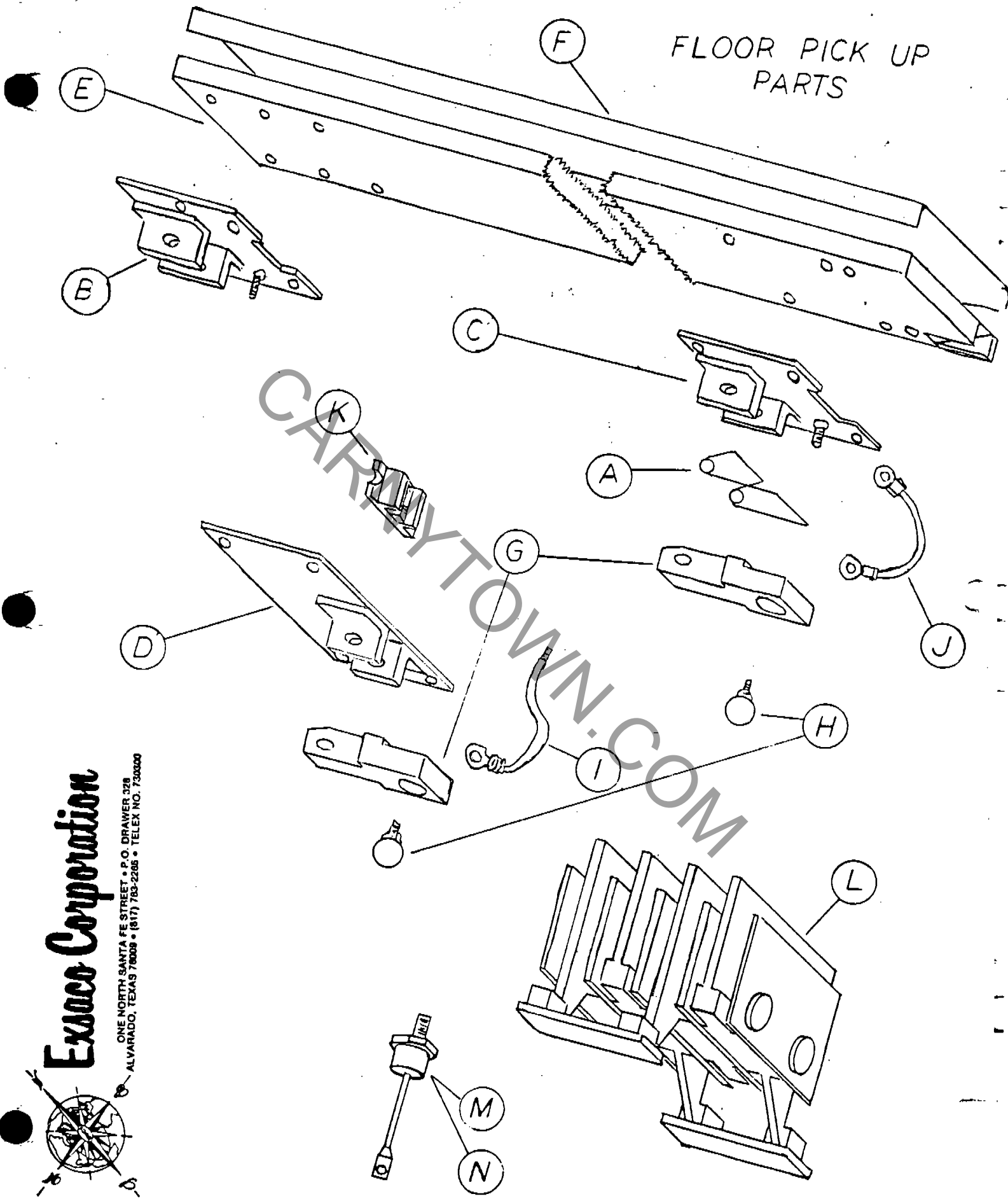


PLATE 10 - MOTOR PARTS
(Floor-Pick Up Cars Only)

INDEX NO.	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
A	SBC2301	Drive Unit, Complete	1
B	SBC2302	Coil Assembly	1
C	SBC2307	Armature	1
D	SBC2313	Bracket for Commutator Brush (Left)	1
E	SBC2314	Bracket for Commutator Brush (Right)	1
F	SBC2317	Mounting Block (Brush Mounting)	1
G	SBC2318	Bolts for 2313 (Flat Head)	2
H	SBC2310	Bolts for 2313 (Hex Head)	2
I	SBC2319	Brush Plate (4 Pins)	1
J	SBC2335	Flywheel (finned) Clutch	1
<u>Additional Parts Not Pictured</u>			
K	SBC2601	Axle for Right and Left Side	2
L	SBC2605	Iron Back Wheel (1 7/8" Wide)	2

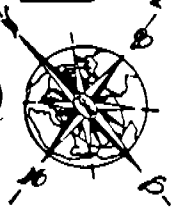


FLOOR PICK UP PARTS



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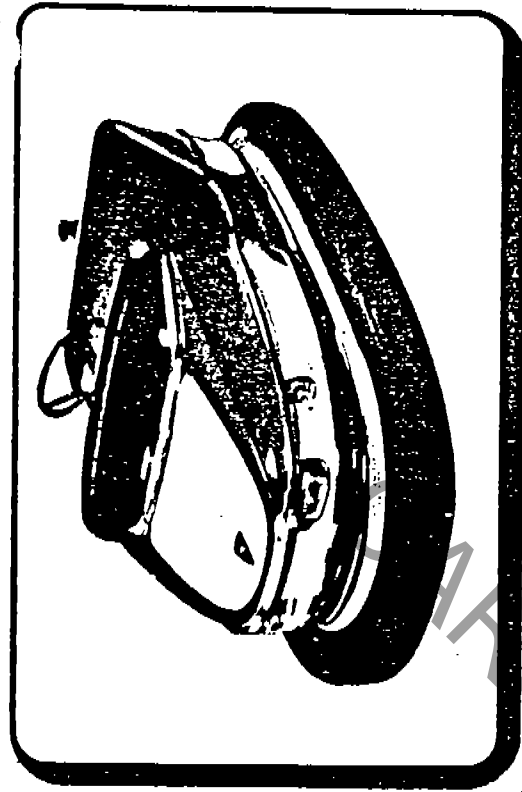
ADDITIONAL PARTS FOR FLOOR-PICK UP CARS

INDEX	PART NO.	DESCRIPTION	NO. REQ. PER AS
A	SBC2775	Spring for Floor Contact Brush	4
	SBC2776	Floor Contact Brush, <u>Cast Iron</u>	2
B	SBC2777	Bracket for Floor Contact Brush (Front)	1
C	SBC2780	Bracket for Floor Contact Brush (Center Rear)	1
D	SBC2781	Bracket for Floor Contact Brush (Rear Right & Left)	2
E	SBC2778	Insulator Board	1
F	SBC2779	Insulator Material	1
	SBC2784	Polyurethane Floor Contact Brush, Complete	4
G	SBC2785	Polyurethane Floor Contact, Holder Only	4
H	SBC2786	Steel Contact Ball	4
I	SBC2788	Jumper Wire, 1 Terminal	2
J	SBC2789	Jumper Wire, 2 Terminal	2
K	SBC2790	Terminal, Single Pole (for Rear Rt. & Lt. Contacts)	2
	SBC2791	Wire, #10 Blue or Red (Per Foot)	
	SBC2792	Fuse Holder	1
	SBC2793	Fuse for 2792	1
	SBC2943	Transformer, 24 KVA, 3-Phase, 220 V, 60 Cycle (Transformer Only - No Enclosure)	1
	SBC2944	Tap Changer (Speed Control)	1
L	SBC2951	Heat Sink for Rectifiers (sold Complete only)	1
M	SBC2952	Diode - Standard	4
N	SBC2953	Diode - Reverse "R"	4



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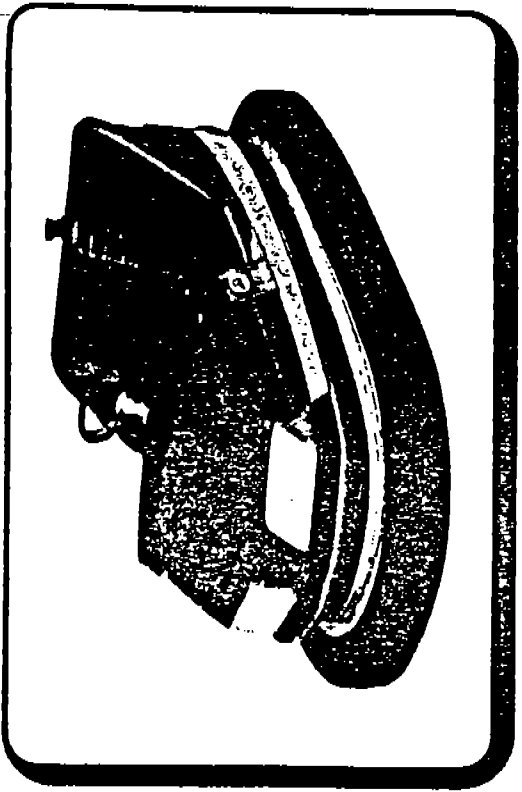
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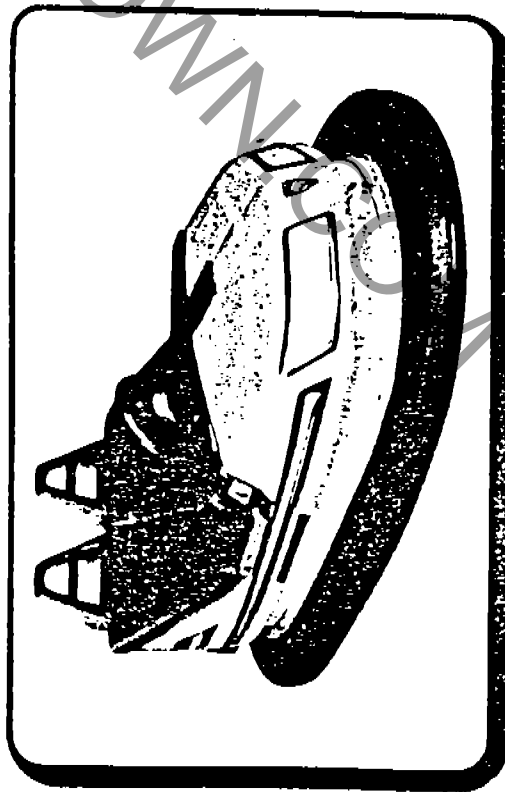
Cosmo



Gemini



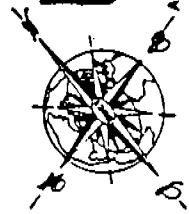
Daytona



Espada

PLATE II
CAR BODIES

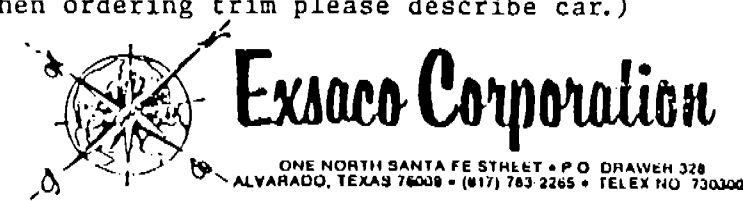
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PLATE 11 - CAR BODY ACCESSORIES BY MODEL

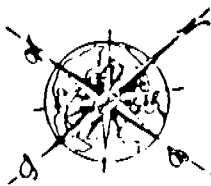
INDEX	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
	<u>COSMO</u>		
A	SBC9540	Head Light Assembly	2
B	SBC9545	Nut (for attaching light assembly to car body)	4
C	SBC9550	Headlight Lens	2
D	SBC9555	Screw (for attaching light lens to light frame)	4
E	SBC9560	Tail Light Assembly (use two 9545 nuts)	2
F	SBC9570	Tail Light Lens (use two 9555 screws)	2
G	SBC9600	Windshield, Non-transparent Fiberglass	1
H	SBC9605	Windshield, Plexiglass	1
I	SBC9650	Dash Pad	1
J	SBC9660	Seat Back	1
K	SBC9670	Seat Bottom	1
L	SBC9690	Nut (for body tie down)	2
M	SBC9710	Marker Light, Front (clear/round)	2
N	SBC9720	Marker Light, Back (red/round)	2
P	SBC9760	Numbers, Stick-on Type (for rear of car)	1
Q	SBC9420	Emblem - "Duce, Made in Italy"	1
	<u>COMET</u>		
R	SBC9610	Reflector, Oblong (specify red or amber)	4
S	SBC9620	Reflector, Round (specify red or amber)	4
T	SBC9630	Screw (for reflector)	16
U	SBC9650	Dash Pad	1
V	SBC9660	Seat Back	1
W	SBC9670	Seat Bottom	1
X	SBC9680	Body, Complete with Seat and Dash Pad	1
Y	SBC9690	Nut (for body tie down and seats)	6
Z	SBC9770	Kick Plate, Right	1
AA	SBC9780	Kick Plate, Left	1
BB	SBC9790	Vinyl Insert for Trim (per foot)	
CC	SBC9800	Aluminum Trim (per foot)	
DD	SBC9810	Rivets for Aluminum Trim	
EE	SBC9410	Emblem - "Duce, Mark of Excellence"	1
	<u>MACH I</u>		
FF	SBC9560	Tail Light Assembly (use two 9545 nuts)	2
GG	SBC9570	Tail Light Lens (use two 9555 screws)	2
HH	SBC9580	Head light Assembly	2
II	SBC9590	Head Light Lens	2
JJ	SBC9595	Screw (for attaching 9580/9590 to car body)	2
KK	SBC9640	Dash Pad	1
LL	SBC9660	Seat Back	1
MM	SBC9670	Seat Bottom	1
NN	SBC9690	Nut (for body tie down)	2
PP	SBC9750	Numbers, Chrome	1
QQ	SBC9760	Numbers, Stick-on Type (for rear of car)	1
RR	SBC9420	Emblem - "Duce, Made in Italy"	1
	All Cars	All chrome trim, lights and other body parts must be ordered by description. (Due to changes in bodies, when ordering trim please describe car.)	



CONTINUATION OF PLATE 11 - CAR BODY ACCESSORIES BY MODEL

INDEX	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
	Gemini		
A	SBC1903*	Body w/Headrest-Metal Flake (incl. lights, seat, dash)	1
B	SBC1909	Chrome Trim for Headrest (specify length)	
C	SBC1910	Headrest Pad	
D	SBC1911	Black Trim (for rail fitting hole)	
E	SBC1912	Screw (6 req./headrest, 4 req./dash pad, 18 req./rear lens)	
F	SBC1913	Washer, Finish (use w/1912) (6 req./headrest, 18 req./rear lens)	
G	SBC1930	Upholstery, complete seat and dash (incl. all hardware)	1
H	SBC1931	Seat Back	1
I	SBC1932	Seat Bottom	1
J	SBC1933	Dash Pad	1
K	SBC1934	Black Finish Washers	4
L	SBC1940	Kickplate, Left	1
M	SBC1941	Kickplate, Right	1
N	SBC1942	Rivets, Large Head (for kickplate)	4
P	SBC1943	Back-up Washers, Large (for kickplate)	8
Q	SBC1944	Rivets, Small Head (4 req./kickplate, 16 req./light socket)	
R	SBC1950	Lens, Right Front (clear)	1
S	SBC1951	Lens, Left Front (clear)	1
T	SBC1952	Trim, Right Front (black)	1
U	SBC1953	Trim, Left Front (black)	1
V	SBC1954	Screw, Black (for front lens)	6
W	SBC1955	Lens, Right Rear (red)	1
X	SBC1956	Lens, Left Rear (red)	1
Y	SBC1958	Cushion, Tail Light (per rear lens)	
Z	SBC1959	Light Socket	4
AA	SBC1960	Bracket (for light socket)	4
BB	SBC1961	Screw, Sheet Metal (for rail fitting hole)	2
CC	SBC1962	Light Bulb	4
DD	SBC1970	Emblem	1
EE	SBC1976	Numbers, Black (3" X 1 1/2")	1
FF	SBC9810	Rivets (for emblem and black trim)	6

*Not
Shown
on
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PLATE 12 - SPECIAL SCOOTER CAR TOOLS

INDEX NO.	PART NO.	DESCRIPTION	NO. REQ. PER ASSY.
A	SBC1001	Transmission Mount (holds transmission for removal of #3350 clutch flywheel)	1
B	SBC1002	Spanner Wrench (tightens #8780 rail fitting)	1
C	SBC1003	Spanner Wrench (for removal of #335 clutch flywheel)	1
D	SBC1004	Socket Wrench (for #2100 nut to separate 101 from 1020)	1
E	SBC1005	Socket Wrench (for removing #2110 locking nut)	1
F	SBC1006	Bolt, reduced shank (for removal of #3080 motor end plate)	1
G	SBC1007	Tee Wrench (for use with 3040/4250/5070/8050/8060)13mm	1
H	SBC1008	Tee Wrench - 17mm	1
I	SBC1018	Socket Wrench (for use with #9040 nut)	1
J	SBC1025	Tool Kit, Complete (includes all above tools)	1

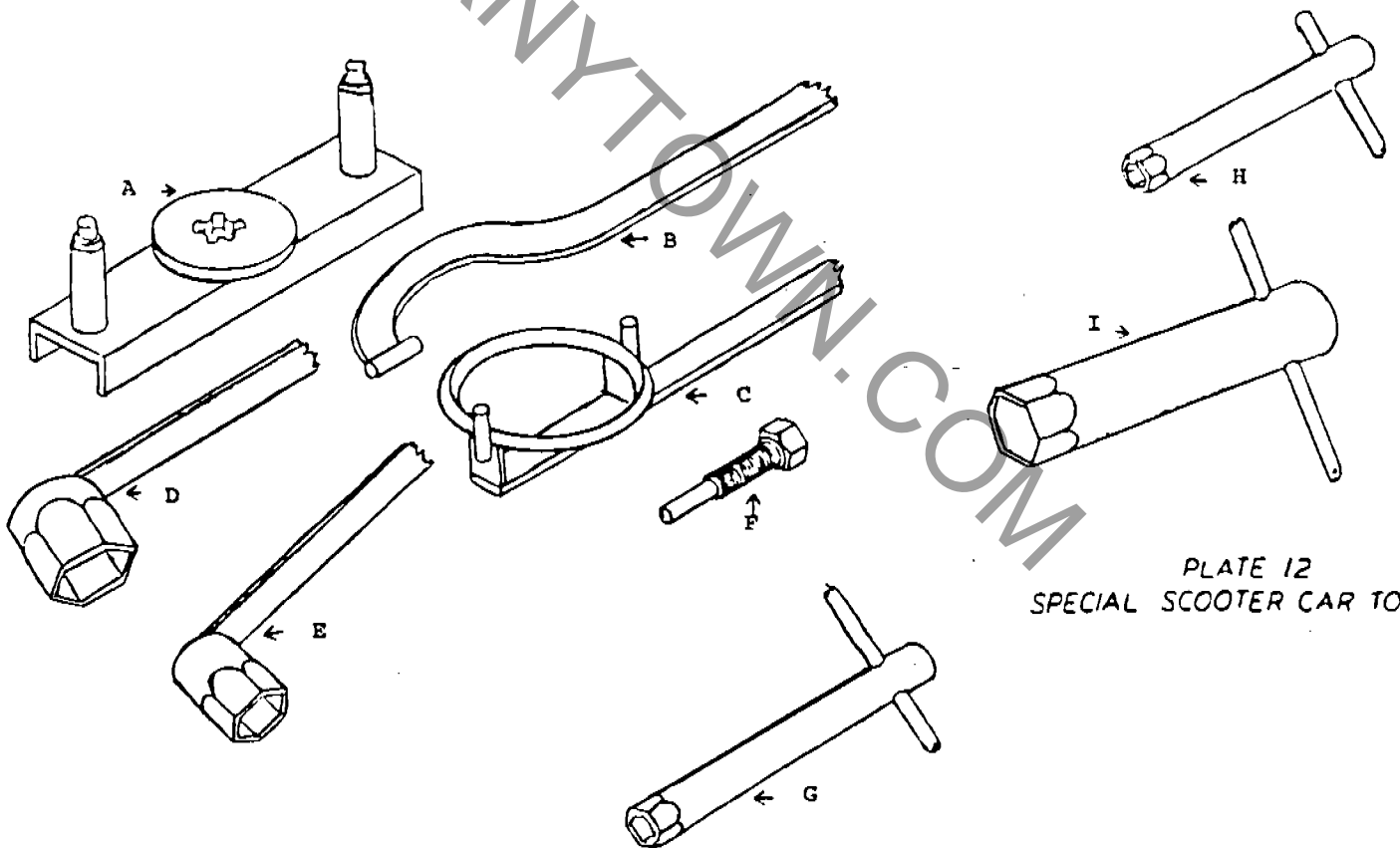


PLATE 12
SPECIAL SCOOTER CAR TOOLS



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RECOMMENDED LIST OF SPARE PARTS FOR 12 BUMPER CARS

<u>QTY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
		<u>For Ceiling Pick-up Cars</u>
5	SBC7500	Pedal rebuilding kit
2	SBC8000	Wide wiper blade assy., complete
6	SBC8020	Wide wiper blade
2	SBC8030	Connecting bracket
2	SBC8060	Pivot bolt
2	SBC8050	Hex nut
14	SBC8080	Trolley spring
1	SBC8300	Set collar
2	SBC9500	Diode for Duce converter
1	SBC1002	Spanner wrench
1	SBC1018	Socket wrench
3	SBC3750	Brush kit
4	SBC1090	Hex nut
2	SBC3300	Bearing
5	SBC9220	Fuse
		<u>For Floor Pick-up Cars</u>
5	SBC7500	Pedal rebuilding kit
1	SBC1018	Socket wrench
3	SBC3750	Brush kit
4	SBC1090	Hex nut
2	SBC3300	Bearing
10	SBC2775	Spring for floor contact
4	SBC2784	Polyurethane Pick-up, complete
10	SBC2786	Steel contact ball
5	SBC2788	Jumper wire, 1 Terminal
5	SBC2789	Jumper wire, 2 Terminal
5	SBC2793	Fuse
4	SBC2752	Diode - Standard
4	SBC2953	Diode - Reverse



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S.D.C. BUMPER CARS

OPERATION, MAINTENANCE AND TROUBLE SHOOTING HINTS

1. After initial few days of operation, tighten all electrical connections. An application of heavy-duty "loc-tite" is recommended at this point.
2. Lubrication -
 - A. All bearings inside the drive unit are sealed and require no additional lubrication.
 - B. Wheel bearings should be inspected and packed between 20,000 and 30,000 rides per car. Any good grade wheel bearing grease will do.
 - C. Once every week apply a small amount of grease to the ends of the hinge (706) and the switch hinge (709).
 - D. The bearings (104) between the inner housing (102) and outer housing (101) should be lubricated once a year or sooner if there is evidence of hard steering.
 - E. The transmission is filled and sealed at the factory. Unless there is evidence of loss of grease through the transmission seals, only yearly lubrication is required. At this time, open the inspection bolt and with a grease gun shoot one or two shots of multi-purpose grease into the opening. **CAUTION: OVERFILLING WILL DESTROY SEALS. THIS UNIT REQUIRES ONLY 1/2 CUP WHEN FILLED FROM EMPTY.**
3. Clutch - The clutch is a simple centrifugal unit that has only four moving parts, resulting in a long trouble-free life. Clutch linings have a life expectancy of 20,000 or more rides. A high pitch metal screeching sound, similar to worn auto brakes, is an indication that new clutch lining is needed at once.
4. Electrical - The motor is a 90V DC, series wound unit; it is speed controlled by varying the voltage. As a result of this design, voltage fluctuations are not harmful.
 - A. There are two sets of brushes in the motor.
 1. The double brush holders (312) have a long life as they contact the slow rotating, smooth slip ring (324).
 2. The single brush holders (203) and brushes (204) operate against the grooved commutator at a relatively high speed and wear at moderate rate. The brushes should be replaced when they no longer project above the brush holder. At this point, they may stick and arc against the armature.
 3. The field winding (302) can be replaced by removing bolts (304) and laminated block (303). Use caution in reassembling so as not to cut through insulation.



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- B. Pedal assembly - This unit is purposely simple in design. The switch is an "over center" unit that snaps on or off and cuts arcing to a minimum.
1. Copper blocks (721 and 724) serve as electrical contact points. The life of these blocks can be extended by occasionally smoothing the contact surfaces with a file. It is best to file these while out of the pedal assembly.
 2. Keep bolt (718) and nut (218) and bolt (723) and nut (218) tight. A loose connection at these points puts undue strain on the fiber washer (719) causing arcing and failure. In some situations, it is advisable to use two insulators (720) if arcing occurs at this point.
- C. Lights - All lights are wired in a series so that rugged 12 or 24 volt bulbs can be used; and if one burns out all fail. There is a fuse in front and under the seat on the older cars. The later cars may have an American-made "in-line" fuse. The European fuse can be obtained at any auto parts house.
5. Tire pressure should be checked regularly and kept at 16 lbs. per square inch. Low pressure allows car bodies and trim to come in contact when two cars meet. Slight nicks in the front trim are a sure sign of low tire pressure. Over inflation may cause severe bouncing between cars and possible injuries to patrons.
 6. Rear steel wheel must be kept clean to make a good electrical contact or the cars will slow down. Clean the wheel with a wire brush only.
 7. As the wheels (front and rear) wear, it is possible for them to reach a point where the bumper tire drags on the floor. Letting the wheels wear to this point is false economy as the bumper tires are expensive. A temporary fix while awaiting the arrival of new wheel is to place 4 or 5 washers between parts No. 102 and 317 and 423 on each stud (220). The effect is to raise the car 1/4 to 1/2" higher from the floor.
 8. Lubricate the bumper tires. We recommend the use of talc as a lubricant to be applied to the side of the tires and the inner rail surfaces of the building. Its use provides a glancing blow upon impact, giving freer and accelerated movement of the cars. Make a paste with water and apply freely. New compounds of silicone work extremely well also.
 9. Blow the motor cap out with compressed air each week. This is probably the single, most important maintenance point one can have. Dust builds up causing heat and gets into moving parts -- this can cause brushes to arc to the motor housing.
 10. Contact between the ceiling and the car trolley assembly - one of the most frequent trouble spots. The car not only moves in its steered direction, but during a severe bump with the rail or another car, the



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