

# **OPERATION AND MAINTENANCE MANUAL WITH PARTS LIST**

<b>MODEL:</b>	<b>B2-56</b>
<b>SERIAL NO:</b>	<b>114200 &amp; UP</b>
<b>MANUAL NO:</b>	<b>MB-256-01</b>

## **\*\*IMPORTANT\*\***

READ AND FOLLOW INSTRUCTIONS GIVEN IN  
SAFETY AND OPERATIONS SECTIONS, AND  
THOSE SECTIONS RELATED TO YOUR SERVICE  
AND REPAIR RESPONSIBILITIES.



**TAYLOR-DUNN®**  
Commercial and Industrial Vehicles Since 1949

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- IMPORTANT INFORMATION -

This vehicle conforms to applicable portions of ANSI B56.8 (American National Standard Personnel and Burden Carriers). This manual is designed for use by Vehicle Operators and Service Personnel alike. Throughout the manual, there are various WARNINGS, CAUTIONS and NOTICES which must be carefully read to help reduce the possibility of personal injury. Maintenance personnel must understand that if a service procedure or method is used that is not recommended by Taylor-Dunn, it then becomes the personal responsibility of the person performing the work to first satisfy himself that neither his safety, the safety of others, or the safety of the vehicle will be endangered.

Definitions of the three terms are as follows:

WARNING - There is a potential for injury to yourself or others.

CAUTION - There is a potential for damage to the vehicle.

NOTE - Specific information clarifying or giving the reason for a particular maintenance or service procedure.

Before operating your Taylor-Dunn vehicle, it is your responsibility to read, understand and follow the safety and operating instructions contained in this manual to help ensure your safety and comfort. If this car is to be used for rental purposes, it is your responsibility to explain to the operator about the various controls and vehicle operating characteristics. Equally important is the operators need to know the basic rules required for safe operation of the vehicle in day to day usage. Sections 5 and 6 of ANSI B56.8 have been inserted in Section B, page 3 of this manual for your specific operating guidelines.

1. Vehicle is to be operated only by qualified persons and only in designated areas.
2. Vehicle will not be started until all occupants are seated.
3. Occupants must remain seated while vehicle is in motion.
4. Arms, legs and feet must be kept inside while vehicle is in motion.
5. Slow down when making a turn.
6. Drive slowly straight up and down inclines.
7. Set parking brake before leaving vehicle.
8. Forward/Reverse lever must be in the correct position for direction of travel desired.

**WARNING:** *Failure to comply with above instructions could result in injury to the vehicle occupants, bystanders and to property.*

INSPECTION, SAFETY AND INTRODUCTION  
ARRIVAL INSPECTION CHECKLIST

Visual inspection should be made to determine that the truck has remained in good condition during transit. If any damage is found, the details should be noted on the delivery receipt immediately. After delivery the truck should be most carefully checked for HIDDEN DAMAGE. Any concealed damage not noted on the delivery receipt should be reported, in writing, to the delivering carrier within 48 hours.

The following checklist has been prepared to aid you during arrival and inspection of your vehicle.

- A. Open all packages and examine any accessories which may be shipped detached from vehicle.
- B. Examine wiring for visible evidence of damage. Check all connections to insure that none have loosened during transit.
- C. Check all battery connections and electrolyte level in each cell.
- D. Inspect battery charger in accordance with manufacturers installation instructions.
- E. Check tires for damage and proper inflation. Check wheel lugs to insure their being tight.
- F. If vehicle is equipped with hydraulic brakes, check hydraulic lines for evidence of damage.
- G. Check brake fluid level in master cylinder.
- H. Examine entire vehicle for damage such as dents or cracks.
- I. Check operation of controls to see that they are working freely.

Upon completion of the Visual Inspection, an operational test should be made after reading the remainder of Section A and Operating Instructions contained in Section B.

INSPECTION, SAFETY AND INTRODUCTION  
SAFETY

The safe and satisfactory use of any vehicle is a responsibility shared by many persons.

As the manufacturer, we feel that it is our responsibility to emphasize vehicle characteristics and make safety recommendations regarding those characteristics. That is the primary purpose of this portion of the manual.

Persons who operate this vehicle need to be aware of, and to observe, the safe driving rules established in their locality, and need also be aware of the vehicle operating characteristics and safety recommendations of the manufacturer, to assist them in exercising the judgment necessary to prevent injury to themselves or to others.

Persons who service and maintain the vehicle need to be aware of how their activities relate to safe vehicle operation, and of potential hazards involved in the service and maintenance processes, to assist them in applying sensible judgment to those processes.

STEERING: This vehicle has a very small minimum turning radius, and low ratio steering leverage.

These characteristics, so desirable for maneuverability at slow speeds, require that great care be exercised at high speeds to avoid turning so sharply that one or more wheels lose contact with the ground, or that the vehicle is caused to overturn. Be especially careful while traveling on an incline. Avoid sharp turns, even at slow speeds.

SPEED: This vehicle is designed to attain its maximum safe operating speed on level ground. That speed can easily be exceeded when traveling downhill. If this is allowed to occur, vehicle stability and braking performance become unpredictable. Do not exceed, under any conditions, the maximum vehicle speed of 10 MPH.

CONTROLS: Bring the vehicle to a complete standstill before operating the forward/reverse switch to change direction of travel. Operation of this control while the vehicle is in motion can result in complete loss of power.

Do not use the accelerator to hold the vehicle at a standstill on an incline. This can cause complete power loss. Use only the brakes to hold the vehicle at rest while on a hill.

BRAKES: The brake system relies on contact of rear tires with the ground for effectiveness. As tire to ground contact is reduced, braking effect is reduced. While driving, the operator must consider terrain, speed, and steering maneuvers to prevent tires from losing contact with the ground, with consequent reduction of braking action.

INSPECTION, SAFETY AND INTRODUCTION  
SAFETY

Maintenance Many operating characteristics relate to maintenance in ways which are not readily obvious. Those maintenance characteristics most closely related to vehicle operating safety are indicated in Section E, Page 1, and Section D, Page 1 and Page 2.

Also to be considered is the safety of personnel who perform service and maintenance duties. Two characteristics need special emphasis.

1. This electric vehicle does not "idle" noisily, is never "out of gear", and is set into motion whenever the battery to motor circuit is closed, intentionally or otherwise. Whenever practical, disconnect battery leads to avoid unintentional starting of the motor during servicing or maintenance.
2. Batteries emit gasses which can be explosive, especially while they are being charged. Personnel who are involved with servicing vehicles, or maintaining vehicles, need to be made familiar with this hazard. A detailed explanation is contained on Pages 1 and 3 of Section J8.

CAUTION:

1. When performing maintenance on any part of the vehicle electrical system, disconnect main battery leads, place forward/reverse switch in neutral. Remove key from keylock in dash panel.
2. Never replace a circuit fuse with one having a higher rating than the original equipment fuse. Fuses have been selected to provide full circuit protection for all operating conditions. A FUSE WILL ONLY BLOW DUE TO A SHORT-CIRCUIT. Therefore, always locate and correct the cause of short-circuit before replacing a blown fuse. Using a fuse of higher rating is an UNSAFE PRACTICE and could cause serious damage to equipment.
3. Intentional or unintentional mis-use of controls could result in an accident.

INTRODUCTION

This vehicle is designed to be driven on smooth surfaces in and around inductiral plants, foundries, railroads and other heavy duty applications. It is not designed to be driven on the public highways or to go in excess of 10 MPH on level surfaces or downhill. Speeds in excess of this may result in steering difficulty and motor damage. Maximum speed while towing is 10 MPH.

MODEL NUMBER

This manual covers Model 1256B and B0-012-56 starting with Serial Number 30705.

SERIAL NUMBER

The serial number of your unit is stamped into the top edge of the top left side of the drivers seat. The model number and serial number are on a nameplate riveted to the dash panel steering support shelf forward of the steering column, or on the kick panel below the passenger seat. In ordering parts or referring to your unit please use these numbers. Replacement parts can be purchased directly from your local authorized dealer.

## OPERATING INSTRUCTIONS

The controls on your Taylor-Dunn vehicle have been designed and located for convenience of operation and efficient performance. Before driving your vehicle for the first time, familiarize yourself with each of the controls after carefully reading the instructions contained in this manual.

### STEERING

The steering wheel and steering system is similar to automotive types. Turn the steering wheel to the right (or clockwise) for a right turn and left (or counterclockwise) for a left turn.

### KEYLOCK

Your vehicle is equipped with a keyed lock located in the dash panel. It is designed to lock the switch in the neutral position only. The key will remove from the lock in the locked position (neutral) only.

### BRAKE-AUTOMATIC (DEADMAN)

The drivers seat operates the automatic "deadman" brake. The weight of the person moves the seat down and operates the brake release linkage. The brake is automatically applied when the seat is vacated. In conjunction the power to the drive motor is disconnected as the brake is applied.

### BRAKE (FOOT)

The brake pedal is designed and located for right foot operation. It is the pedal located to the left of accelerator pedal. It functions the same as the brake pedal in your automobile. Depressing the pedal applies the braking action. The greater the effort applied to the pedal with your foot, the greater the braking action to your vehicle. Removing your foot from the pedal allows immediate release of the braking action to your vehicle.

### FORWARD/REVERSE SWITCH

The forward/reverse switch is located on the steering column. It is operated by the handle. To place in forward position push the handle forward. To place in reverse position pull handle backward towards the rear.

### ACCELERATOR PEDAL

The accelerator pedal is located to the right of the brake pedal. It is designed for right foot operation similar to your automobile. Depressing the pedal turns the power on to the motor. It also controls the amount of power delivered to the motor. When driving your vehicle you will be able to feel full power when accelerator is full depressed and minimum power when only partially depressed. You will have the same control of power in both directions of travel. Your forward/reverse switch determines the direction of travel and your accelerator pedal controls the speed.

### HORN BUTTON

The horn button is located at center of steering wheel. Depressing button sounds horn. Releasing button will immediately silence horn.

### LIGHT SWITCH

The light switch that controls headlamps and taillamps is located in the dash panel. It is labelled for ON-OFF positions.

### BATTERY CHARGER

See section J8 for proper instructions to operate your battery charger.

### SPECIAL ACCESSORIES

Refer to the appropriate section of this manual for separate operating instructions pertaining to any special feature or accessory your vehicle may have.

OPERATING YOUR VEHICLE

To put your vehicle into operation, turn key clockwise. Next select the direction by moving the handle forward or backward. Slowly depress the accelerator pedal to go in the desired direction and speed selected. For greatest efficiency it is recommended that you travel at the fastest speed that you can safely maintain. You will find that your vehicle will consume almost as much current at low speed as it does at higher speeds. Therefore, without taking any unnecessary risk traveling at the faster speed will deliver more miles per battery charge than continual use in the lower speed range.

CAUTION: Do not "hold" vehicle at a stanstill on a hill or incline using your accelerator only. Continued "stalled" condition as described will damage motor and electrical controls. Use your foot brake to hold the vehicle on a hill safely.

When you leave your vehicle, it is best to always place forward/reverse switch in neutral position. The deadman brake will prevent vehicle from rolling free. Lock and remove key.

Drive safely and enjoy your Taylor-Dunn vehicle.



AMERICAN NATIONAL STANDARD  
PERSONNEL AND BURDEN CARRIERS

OPERATING RESPONSIBILITIES

ANSI B56.8-1981

SECTION 5

OPERATING RULES AND PRACTICES

501 OPERATOR QUALIFICATIONS

Only trained and authorized operators shall be permitted to operate a Personnel and Burden Carrier. Operators of Personnel and Burden Carriers shall be qualified as to visual, auditory, physical, and mental ability to safely operate the equipment according to Section 5 and all other applicable parts of this standard.

502 PERSONNEL AND BURDEN CARRIER OPERATORS' TRAINING

(a) The carrier owner, lessee, or employer of the carrier operator shall conduct an operators' training program for the carrier operators.

(b) Successful completion of the operators' training program shall be required by the owner, lessee, or employer of the carrier operator before operation of the Personnel and Burden Carrier by any operator.

(c) An effective operator's training program should center around user company's policies, operating conditions, and their Personnel and Burden Carrier. The program shall be presented complete to all new operators and not condensed for those claiming previous experience.

(d) Information on operator training is available from several sources, including carrier manufacturers.

(e) The carrier owner, lessee, or employer of the carrier operator should include in the operators' training program the following:

(1) Careful selection of the operators, considering physical qualifications, job attitude, and aptitude

(2) Emphasis on safety of stock, equipment operator, and other employees.

(3) General safety rules contained in this standard and the additional specific rules determined by the carrier owner, lessee, or employer of the carrier operator in accordance with this standard, and why they were formulated.

(4) Introduction of equipment, control locations and functions, and explanation of how they

work when used properly and when used improperly; and ground and floor conditions, grade, and other conditions of the environment in which the Personnel and Burden Carrier is to be operated.

(5) Operational performance tests and evaluations during, and at completion of, the program

(6) Rules of the employer and any applicable labor contract governing and dealing with discipline of employees for violation of employer's rules, and including safety rules

503 OPERATOR RESPONSIBILITY

Operators of Personnel and Burden Carriers shall abide by the following safety rules and practices in 504, 505, 506, and 507.

504 GENERAL

(a) Safeguard the pedestrians at all times. Do not drive carrier in a manner that would endanger anyone.

(b) Riding on the carrier by persons other than the operator is authorized only when personnel seat(s) are provided. Do not put any part of the body outside the outer perimeter of the carrier.

(c) When a Personnel or Burden Carrier is left unattended, stop carrier, place directional controls in neutral, apply the parking brake, stop the engine or turn off power, turn off the control or ignition circuit, remove the key if provided, and block the wheels if machine is on an incline.

(d) A Personnel and Burden Carrier is considered unattended when the operator is 25 ft (7.6 m) or more from the carrier which remains in his view, or whenever the operator leaves the carrier and it is not within his view. When the operator of a Personnel and Burden Carrier is dismounted and within 25 ft (7.6 m) of the carrier still in his view, he still must have controls neutralized, and brakes set to prevent movement.

(e) Maintain a safe distance from the edge of ramps and platforms.

(f) Use only approved Personnel and Burden Carriers in hazardous locations.

(g) Report all accidents involving personnel, building structures, and equipment.

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PERSONNEL AND BURDEN CARRIERS

ANSI B56.3-1981

(h) Operators shall not add to, or modify, the Personnel and Burden Carrier.

(i) Fire aisles, access to stairways, and fire equipment shall be kept clear.

(j) Operators and personnel shall be warned of the hazards of long hair and loose clothing.

#### 505 TRAVELING

(a) Observe all traffic regulations, including authorized plant speed limits. Under normal traffic conditions keep to the right. Maintain a safe distance, based on speed of travel, from the carrier or vehicle ahead; and keep the Personnel and Burden Carrier under control at all times.

(b) Yield the right of way to pedestrians, ambulances, fire trucks, or other carriers or vehicles in emergency situations.

(c) Do not pass another carrier or vehicle traveling in the same direction at intersections, blind spots, or at other dangerous locations.

(d) Keep a clear view of the path of travel, observe other traffic and personnel, and maintain a safe clearance.

(e) Slow down and sound the audible warning device at cross aisles and other locations where visibility is obstructed.

(f) Ascend or descend grades slowly.

(g) Use extra caution when operating on grades. Never turn on any grade, ramp, or incline; always travel straight up and down.

(h) Under all travel conditions the carrier shall be operated at a speed that will permit it to be brought to a stop in a safe manner.

(i) Make starts, stops, turns, or direction reversals in a smooth manner so as not to shift the load, overturn the carrier, or both.

(j) Do not indulge in stunt driving or horseplay.

(k) Slow down when approaching, or on, wet or slippery surfaces.

(l) Do not run carrier onto any elevator unless specifically authorized to do so. Approach elevators slowly, and then enter squarely after the elevator car is properly leveled. Once on the elevator, neu-

tralize the controls, shut off power, and set brakes. It is advisable that all other personnel leave the elevator before a carrier is allowed to enter or leave.

(m) Avoid running over loose objects on the roadway surface.

(n) Prior to negotiating turns, reduce speed to a safe level, turning hand steering wheel or tiller in a smooth, sweeping motion.

#### 506 LOADING

(a) Handle only stable or safely arranged loads. When handling off-center loads which cannot be centered, operate with extra caution.

(b) Handle only loads within the capacity of the Personnel and Burden Carrier as specified on the nameplate.

(c) Handle loads exceeding the dimensions used to establish carrier capacity with extra caution. Stability and maneuverability may be adversely affected.

#### 507 OPERATOR CARE OF MACHINE

(a) At the beginning of each shift during which the Personnel and Burden Carrier will be used, the operator shall check the carrier condition and inspect the tires, warning devices, lights, battery, controller, brakes, and steering mechanism. If the carrier is found to be in need of repair, or in any way unsafe, or contributes to an unsafe condition, the matter shall be reported immediately to the designated authority, and the carrier shall not be operated until it has been restored to safe operating condition.

(b) If during operation the carrier becomes unsafe in any way, the matter shall be reported immediately to the designated authority, and the carrier shall not be operated until it has been restored to safe operating condition.

(c) Do not make repairs or adjustments unless specifically authorized to do so.

(d) The engine shall be stopped and the operator shall leave the carrier while refueling.

(e) Spillage of oil or fuel shall be carefully and completely absorbed or evaporated and fuel tank cap replaced before starting engine.

(f) Do not operate a carrier with a leak in the fuel system or battery.

(g) Do not use open flames for checking electrolyte level in storage batteries or liquid level in fuel tanks.

## SECTION 6

### MAINTENANCE PRACTICES

#### 601 INTRODUCTION

Personnel and Burden Carriers may become hazardous if maintenance is neglected. Therefore, maintenance facilities, trained personnel, and procedures shall be provided,

#### 602 MAINTENANCE PROCEDURES

(a) Maintenance and inspection of all Personnel and Burden Carriers shall be performed in conformance with the manufacturer's recommendations and the following practices.

(b) A scheduled preventive maintenance, lubrication, and inspection system shall be followed.

(c) Only qualified and authorized personnel shall be permitted to maintain, repair, adjust, and inspect Personnel and Burden Carriers.

(d) Before leaving the Personnel and Burden Carrier, stop carrier, place directional controls in neutral, apply the parking brake, stop the engine or turn off power, turn off the control or ignition circuit, and block the wheels if carrier is on an incline.

(e) Before undertaking maintenance or repair on carrier, raise drive wheels free of floor or disconnect battery, and use chocks or other positive carrier positioning devices.

(f) Block chassis before working under it.

(g) Before disconnecting any part of the engine fuel system of a gasoline or diesel powered carrier with gravity feed fuel systems, be sure shutoff valve is closed, and run engine until fuel system is depleted and engine stops running.

(h) Before disconnecting any part of the engine fuel system of LP gas powered carriers, close the LP gas cylinder valve and run the engine until fuel in the system is depleted and the engine stops running.

(i) Carriers shall be kept in a clean condition to minimize fire hazards and facilitate detection of loose or defective parts.

(t) Modifications and additions which affect capacity and safe machine operation shall not be performed by the customer or user without manufacturer's prior

(i) Operation to check performance of the Personnel and Burden Carrier shall be conducted in an authorized area where safe clearance exists.

(j) Before starting to operate the carrier:

(1) Have operator in the operating position.

(2) Depress clutch (or brake pedal on automatic transmissions and electric carriers).

(3) Place directional controls in neutral.

(4) Start engine or switch electric carrier to "on" position.

(5) Check functioning of directional and speed controls, steering, warning devices, and brakes.

(k) Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check level or leakage of fuel, electrolyte, or coolant. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.

(l) Properly ventilate work area.

(m) Handle LP gas cylinders with care. Physical damage, such as dents, scrapes, or gouges, may dangerously weaken the tank and make it unsafe for use.

(n) Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, guards, and safety devices shall be inspected regularly and maintained in a safe operating condition.

(o) Special Personnel and Burden Carriers or devices designed and approved for hazardous area operation shall be inspected to ensure that maintenance preserves the original approved safe operating features.

(p) Fuel systems shall be checked for leaks and condition of parts. Action shall be taken to prevent the use of the carrier until the leak has been corrected.

(q) The Personnel and Burden Carrier manufacturer's capacity, operation, and maintenance instruction plates, tags, or decals shall be maintained in legible condition.

(r) Batteries, motors, controllers, limit switches, protective devices, electrical conductors, and connections shall be inspected and maintained in conformance with good practice.

have been made, the user shall ensure that capacity, operation, warning, and maintenance instruction plates, tags, or decals are changed accordingly.

(u) Care shall be taken to assure that all replacement parts are interchangeable with the original parts and of a quality at least equal to that provided in the

VEHICLE OWNER AND OPERATOR'S GUIDELINES

OPERATING YOUR VEHICLE

To put your vehicle into operation, unlock forward/reverse switch by turning keyed lock counter clockwise. Select direction you wish to travel by moving handle of forward/reverse switch into position. Release parking brake, slowly depress accelerator pedal until vehicle is moving at the desired speed. Steer vehicle as required utilizing the foot brake and accelerator to control your speed as desired.

CAUTION: DO NOT "hold vehicle at a standstill on a hill or incline using accelerator only. Continued "stalled" condition as described will damage motor and electrical controls. Use either your foot brake or hand brake to hold the vehicle on a hill safely.

CAUTION: When you leave your vehicle, it is best to always place forward/reverse switch in neutral position. Set parking brake to prevent vehicle from rolling free, and lock and remove key.

Drive safely and enjoy your Taylor-Dunn vehicle.

# MAINTENANCE GUIDE CHECKLIST

This checklist is provided for your convenience as a guide for servicing your vehicle. If followed you will enjoy a good running and trouble free unit. It has been set up for average normal use. More frequent service is recommended for extreme or heavy usage. If desired your Taylor-Dunn dealer will gladly perform these services for you as he has expert service men in the field for this purpose. Do not hesitate to call your Service Manager if any questions arise.

CAUTION: When performing maintenance on any part of the electrical system, disconnect the main battery leads. Place forward/reverse switch in Neutral. Turn key off and remove from keylock.

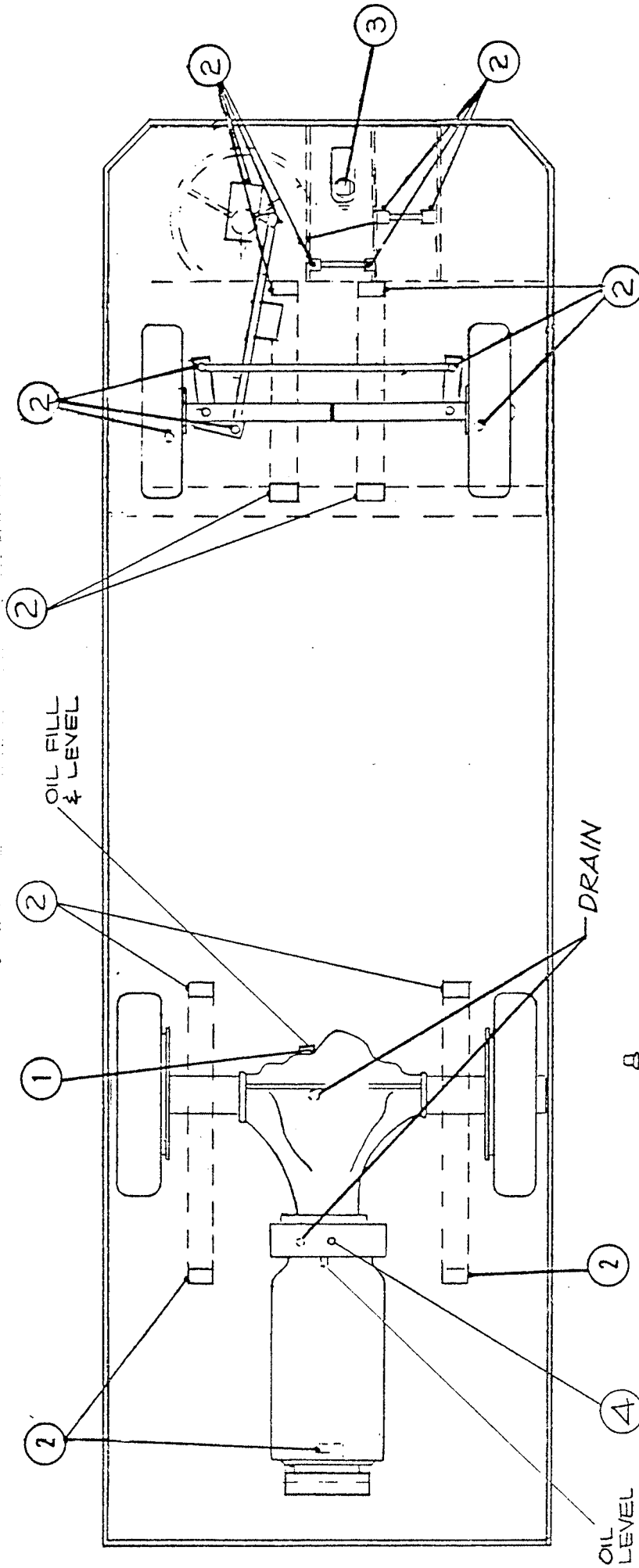
MAINTENANCE SERVICE	REFER SECTION	EVERY WEEK	EVERY MONTH	EVERY 3 MONTHS	EVERY YEAR
Check & fill bateeries. If necessary, fill with distilled water only.	J8	X	X	X	X
Check all contact points on contactor and replace when necessary.	J6		X	X	X
Lubricate all Zerk fittings	E		X	X	X
Lubricate all moving parts without zerk fittings. Use all purpose engine oil.	E		X	X	X
Wash off batteries with water, (use soda if necessary).	JB		X	X	X
Check all wire connections. Be sure they are all clean and tight.			X	X	X
Check service & adjust deadman brake.	J2		X	X	X
Check hydraulic brake system for leaks, also check brake fluid level in master cylinder	J3		X	X	X
Check rear axle differential oil level (refer to lubrication diagram).	J2E		X	X	X

MAINTENANCE GUIDE CHECKLIST

MAINTENANCE SERVICE	SECTION	EVERY WEEK	EVERY MONTH	EVERY 3 MONTHS	EVERY YEAR
Check gear case oil level (refer to lubrication diagram)	J2/E		X	X	X
Check, clean and adjust forward reverse switch	J5		X	X	X
Check motor brushes. Blow out carbon dust. (Replace if necessary).	J2			X	X
Check and adjust front wheel bearings and fork spindle bearings.	J1			X	X
Check brake lining for wear, adjust brake shoes (hydraulic).	J2/J3			X	X
Drain differential and refill with SAE 140 oil (refer to lubrication diagram).	J2/E				X
Drain gear case and refill with SAE 250 (refer to lubrication diagram).	J2/E				X
Repack front wheel bearings (use wheel bearing grease).	J1/E				X

# LUBRICANTS

- ① SAE 140 MULTI-SERVICE GEAR LUBE
- ② PRESSURE GUN GREASE
- ③ BREAK FLUID SAE 70RI
- ④ SAE 250



SECTION E  
PAGE 1

LENGTH | QUAN. | REVISED DATE | REVISION

LUBRICATION CHART  
1256 MODEL "B"

FIGURE 1  
SECTION E

TAYLOR DUNN MFG. CO  
2114 West Ball Rd.  
Anaheim, Calif.

NO.	DESCRIPTION
TOL. FRAC. ±	DEC. ±
SCALE	NONE
DRAWN BY	JM
DATE	5-4-78

SECTION E  
PAGE 1

TROUBLE SHOOTING PROCEDURES

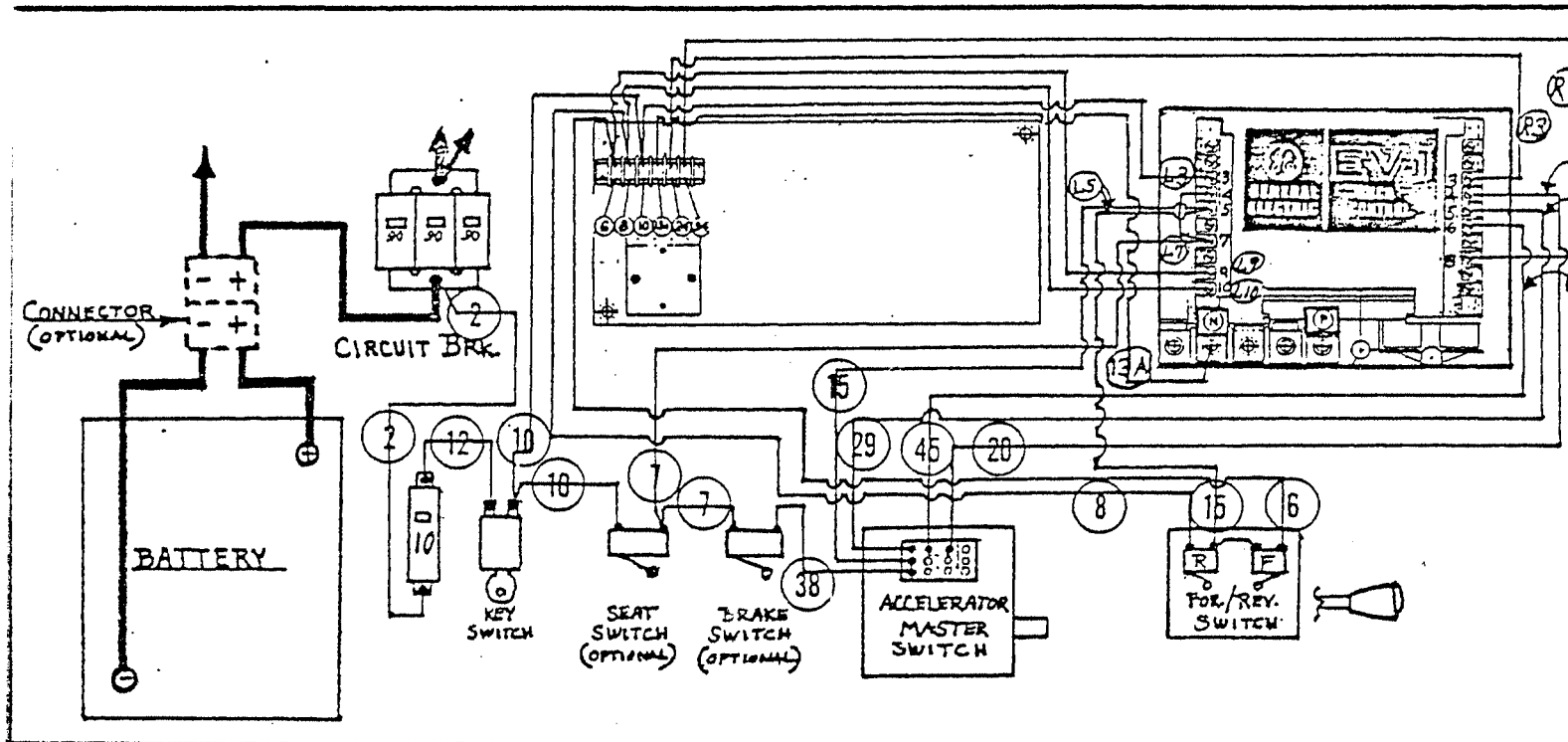
<u>SYMPTOM</u>	<u>PROBABLE CAUSE</u>	<u>CORRECTIVE ACTION</u>
1. <u>STEERING:</u>		
A. Pull in one direction	1. Check for bent steering linkage	Replace or straighten
B. Hard Steering	1. Bad or frozen bearing in spindle	Replace
C. Sloppy or loose steering	1. Loose spindle bearing	Adjust
	2. Loose wheel bearing	Adjust
2. <u>BRAKES:</u>		
A. Soft Brakes	1. Check for worn lining	Adjust or replace when 1/8 or less of lining left
	2. Alignment of brake shoes	Realign
	3. Oil on brake lining	Find oil source and correct, wash brake band
	4. Dirt on brake lining	Clean
	5. Bind in linkage	Loosen or realign
	6. Weak spring	Replace
	7. Air in hydraulic brake	Bleed brakes
	8. Bad seals in brake cylinders	Replace
B. No Brakes	1. Broken shoe	Replace
	2. Broken connection in linkage	Replace
	3. Break in hydraulic line	Repair
	4. Seal failure in brake cylinder	Replace
3. <u>DRIVE AXLE:</u>	On units equipped with EV-1 SCR controls, refer to Supplement for Trouble Shooting and Service Adjustments.	
A. No Power	1. Discharged batteries	Recharge or replace
	2. Check Circuit Breakers	Reset
	3. Check contactor for contact	Replace contacts
	4. Check motor brushes for contact	Clean or replace
	5. Poor contact on forward reverse switch	Replace contact
	6. Check for loose wire	Tighten or replace
	7. Check continuity through motor	Repair or replace



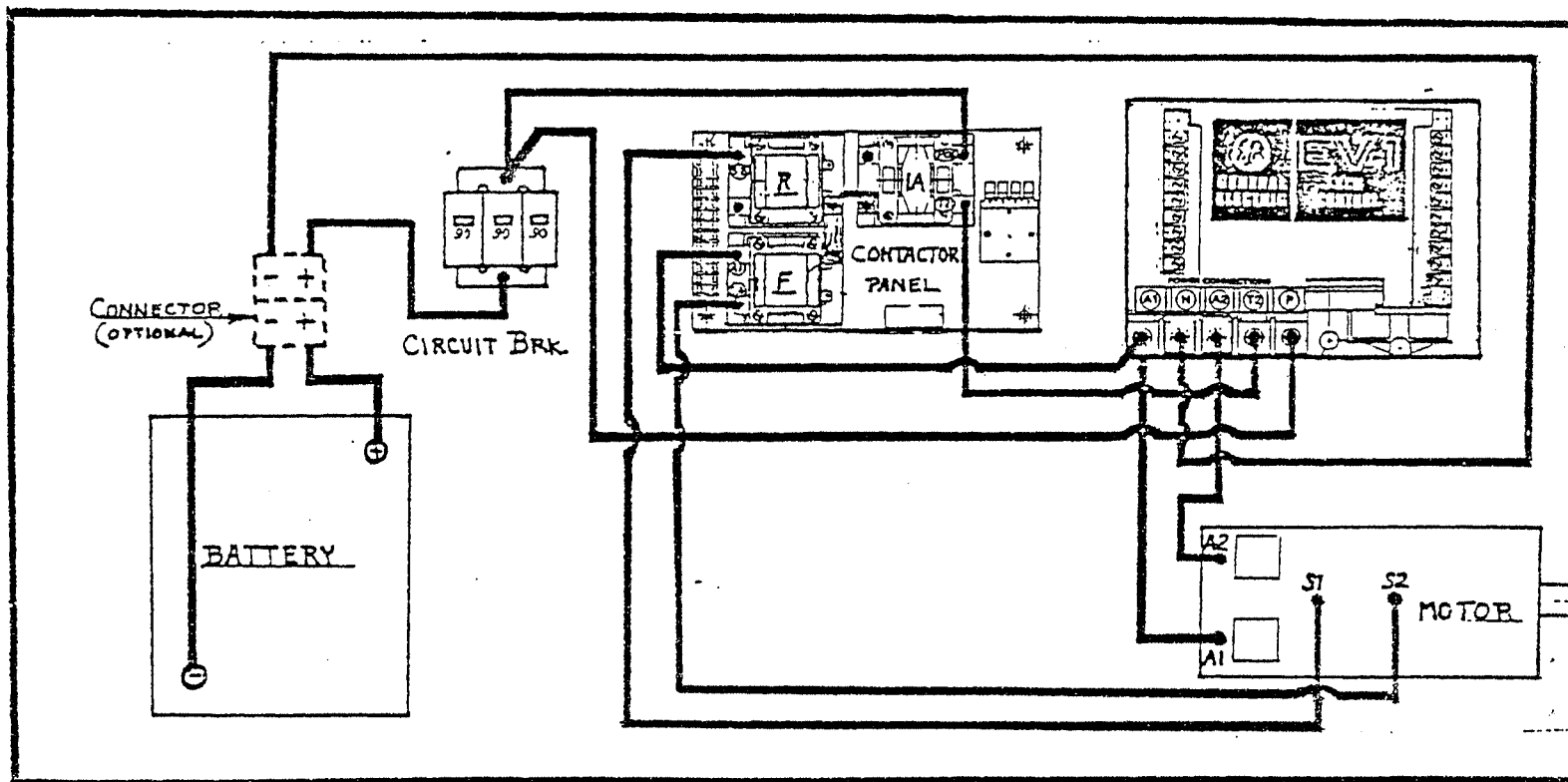
<u>SYMPTOM</u>	<u>PROBABLE CAUSE</u>	<u>CORRECTIVE ACTION</u>
B. Erratic Operation	1. Contact making poor contacts 2. Motor brushes 3. Check motor commutator for burning or wear 4. Check for loose wiring	Replace Contacts Clean or replace Turn or replace Tighten
C. Lack of power or slow operation	1. Dragging brake 2. Tight front wheel bearings 3. Loose connection in wiring 4. Partially burned out motor or thrown lead 5. Weak batteries 6. Bind or drag on differential	Re-adjust Re-adjust Tighten Replace or re-solder Replace Repair
D. Thump or grinding noise in Drive Axle	1. Motor bearing 2. Defective bearing in differential 3. Defective gears in differential	Replace Replace Replace
E. EV-1 SCR	1. Erratic Operation 2. System will not Tune-Up	Refer to Pg. 9 G.E. Instruction Supplement

EV-1 SCR CONTROL AND POWER WIRING DIAGRAMS (150 AMP)

REFER TO FIGURES 1B & 1C



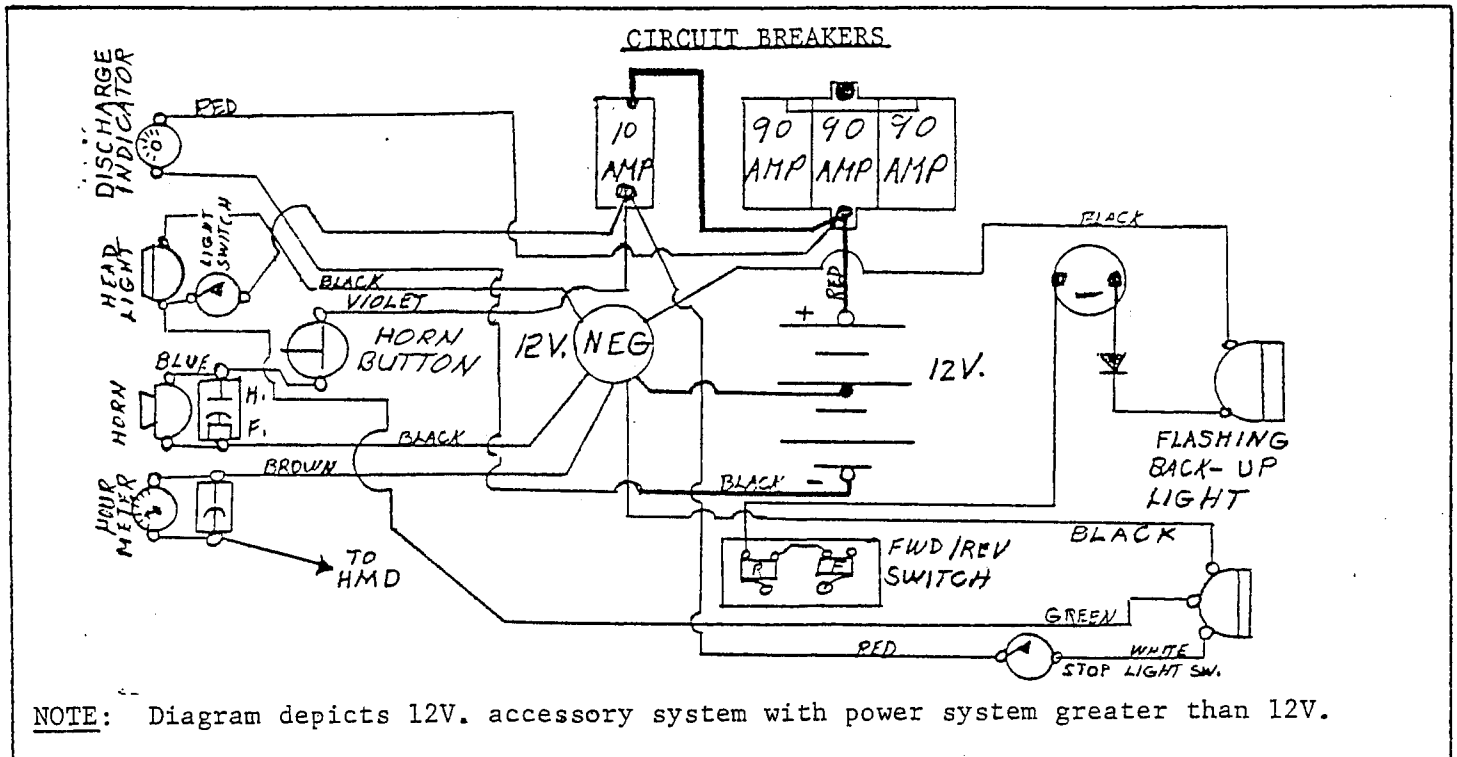
CONTROL WIRING - FIGURE 1B



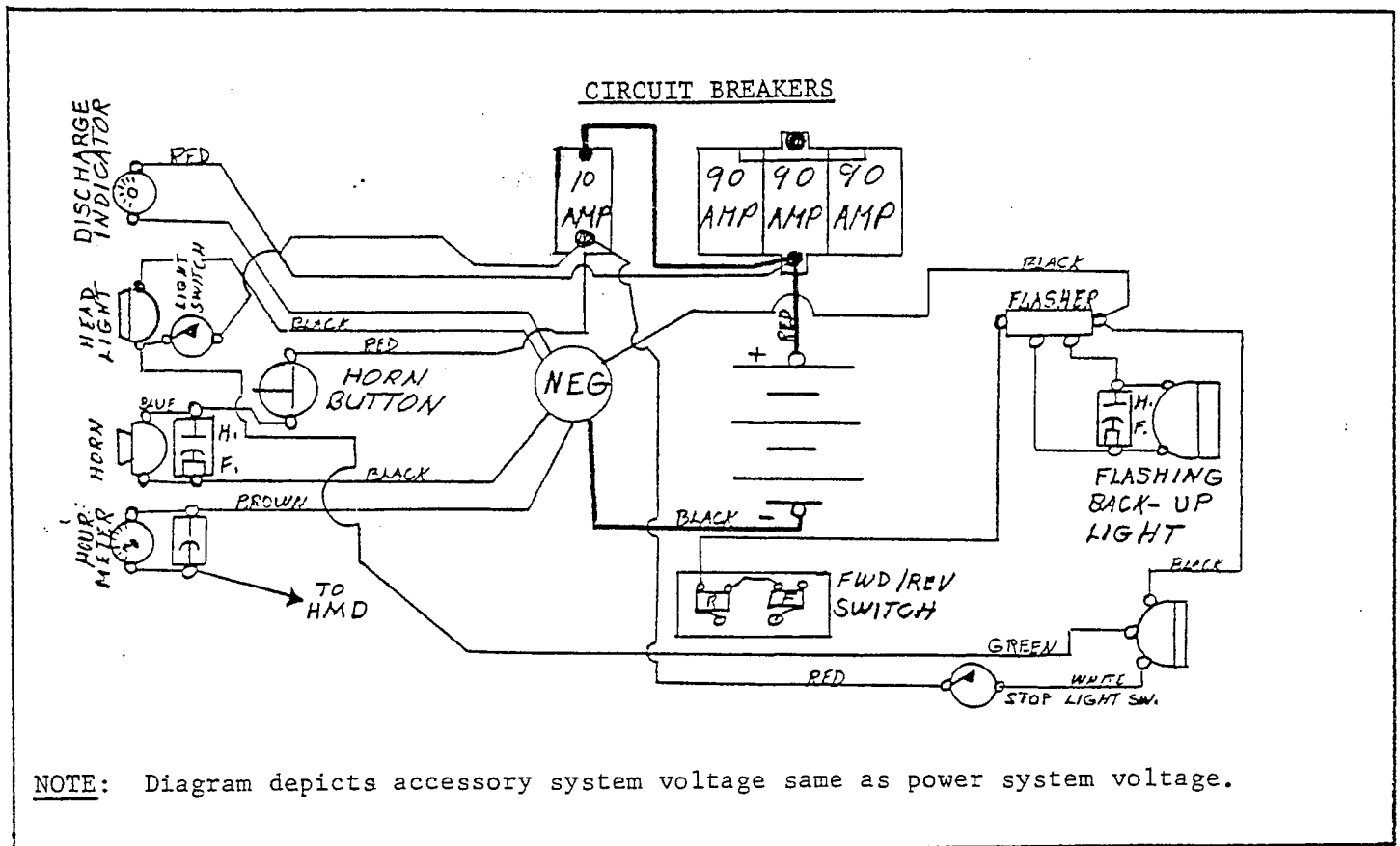
POWER WIRING - FIGURE 1C

EV-1 SCR ACCESSORY WIRING DIAGRAMS

REFER TO FIGURES 2A & 2B



- FIGURE 2A -



- FIGURE 2B -

EV-1 101117

PARTS ORDERING PROCEDURE

Parts may be purchased from your local authorized Taylor-Dunn Dealer. When ordering parts, be sure to specify the complete model no. and serial no. of the unit. Also specify the full Taylor-Dunn part no., description of part, and quantity required. You will find a complete listing of part numbers and descriptions in the following pages of this manual. When ordering parts for the drive motor, it is necessary to include complete name plate data with the order. Be sure to give complete shipping and billing address on all orders. Example:

- 1 - Part #86-501-98 ball joint (left hand thread)
- 1 - Part #70-124-00 (set of 4) motor brushes for  
Baldor Motor, 3½ H.P., 36 Volt, Specification  
Number 28-1408-11704

Parts ordered under warranty must be placed with your authorized Taylor-Dunn Dealer. Be sure to include original invoice number, date of shipment of vehicle, and vehicle serial number.

Note: On contracts with National Federal Government Agencies, Defense General Supply Agency and United States Post Office Department, orders for all warranty parts must be placed directly with the Taylor-Dunn Factory in Anaheim, California.

TAYLOR-DUNN MANUFACTURING CO.  
2114 West Ball Road  
Anaheim, California 92804

Telephone: 714-956-4040  
Telex: 65-5393

SUGGESTED SPARE PARTS LIST

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. OF 1-20 UNITS
------------------	--------------	-------------	-----------------------

## REFER TO FIGURE 4 FRONT AXLE ASS'Y WITHOUT HYDRAULIC BRAKES

4-2	71-501-00	Horn Button (Standard)	1
4-7	96-320-00	Lug Bolt	10
4-16	45-336-00	Oil Seal	2
4-21	32-213-00	Bushing (Nylon) Same on Rear Axle	14
4-22	88-171-20	Shackle Bolt (Non-Lubricated Type) Same on Rear Axle	14
4-23	16-870-00	Shackle Strap (Punched Hole) Same on Rear Axle	5
4-24	16-871-00	Shackle Strap (Threaded Holes) Same on Rear Axle	5
4-36	88-179-81	Lock Nut 9/16" NF (Hex)	6

NOTE: SEE BELOW FOR TIRE INFORMATION

## REFER TO FIGURE 4A FRONT AXLE WITH HYDRAULIC BRAKES

4A-4	88-239-85	3/4" NF Hex Slotted Nut	8
4A-7	80-015-00	3/4" Tapered Roller Bearing	2
4A-8	80-105-00	3/4" Tapered Roller Bearing Race	2
4A-9	97-236-00	1/2" NF Lug Nut	10
4A-10	80-102-00	1 1/4" Tapered Roller Bearing	2
4A-11	80-011-00	1 1/4" Tapered Roller Bearing Race	2
4A-12	45-307-00	Grease Seal	4
4A-13	41-633-00	Brake Shoe w/Lining	8
4A-14	85-212-00	Spring, Brake Shoe Return (Red Color)	8
4A-15	41-683-10	Push Rod, Wheel Cylinder	8
4A-16	99-505-00	Wheel Cylinder	2
4A-21	41-680-10	Adjusting Nut, Brake Shoe	4
4A-22	41-679-10	Adjusting Screw, Brake Shoe	4
4A-23	41-695-10	Anchor Pin, Brake Shoe	4
4A-24	41-677-10	Retaining Ring, Brake Shoe Anchor Pin	4

## REFER TO FIGURE 5 FULL FLOATING REAR AXLE - MOTOR &amp; BRAKES

5-51	13-957-10	Tire & Demountable Wheel 18 x 5 x 14 Solid Cushion Tire (Tractors w/18" Tires Only)	2
5-51	13958-10	Tire & Demountable Wheel 21 x 5 x 15 Solid Xtra Cushion Tire (Tractors w/21" Tires Only)	2

SUGGESTED SPARE PARTS LIST

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QUANTITY OF 1-20 UNITS
5-44	45-010-00	Motor Gasket	2
5-45	45-507-00	Shaft Oil Seal	2
5-46	70-061-00	Motor, 5 H.P., 2800 RPM, 36 Volt	1
5-47	70-112-00	Motor Brushes, Set of 4	1-4
5-47	80-203-00	Ball Bearing Front and Rear	4

NOTE: REFER TO SECTION J2 PAGE 12 FOR SUGGESTED SPARE  
PARTS LIST OF DIFFERENTIAL & BRAKE ASSEMBLY

REFER TO FIGURE 6 HYDRAULIC BRAKE SYSTEM

6-2	71-110-00	Brake Switch	2
6-6	99-510-00	Master Cylinder	1
6-6	99-510-61	Kit - Master Cylinder Repair	2
6-7	99-554-00	Flexible Hose	1
6-10	99-552-01	1/4 Tubing 18" Long with Ends	1
6-11	99-552-02	1/4 Tubing 114" Long with Ends	1
6-12	99-553-00	Tubing Ends	6

REFER TO FIGURE 7 - MECHANICAL CONTROL LINKAGE

7-3	85-280-00	Spring Deadman Brake Return	1
7-4	85-295-00	Spring Accelerator Return	3
7-7	96-762-00	3/8 Clevis	3
7-8	96-772-00	3/8 Clevis Pin	1
7-11	98-200-00	Pad Rubber Brake Pedal	1
7-12	98-253-00	Pad Accelerator Pedal	1
7-14	85-270-00	Brake Return Spring	1
7-22	85-060-00	Spring	1
7-24	41-520-10	Brake Drum	1
7-25	41-650-00	Brake Band	1
7-37	88-014-13	Round Head Machine Screw 6-32 x 1-1/4"	6
7-38	88-019-80	Nut 6-32 (Hex)	6
7-41	71-130-00	Micro Switch (Standard)	2

NOTE: REFER TO SECTION M5 FOR SUGGESTED SPARE PARTS LIST  
EV-1 SCR

GENERAL ELECTRICAL SYSTEMSUGGESTED SPARE PARTS LIST

T-D PART NO.	DESCRIPTION	QUANTITY OF 1-20 UNITS
71-000-00	Light Switch	2
71-120-00	Key Switch	1
72-034-00	Stop and Taillight - 36 Volt	1
73-002-00	Horn - 36 Volt	1
74-000-00	Hour Meter	1
75-123-00	Wire Harness, Control, Power, Lights and Horn	1
76-024-00	Charging Receptacle, Anderson EC 5816B (300 Amp)	1
76-020-00	Charging Receptacle, Anderson SB 7313 (175 Amp)	1
78-010-00	Secondary Fuse & Holder, Inline Type	1
79-823-00	Fuse Buss Type 20 Amp	1
72-007-00	Headlight or Back-up Light - 36 Volt	3
77-200-00	Hydrometer	2
77-201-00	Battery Filler	1
72-500-00	Solenoid 200 Amp	1
79-842-00	Circuit Breaker 10 Amp (1Pole)	1
79-843-00	Circuit Breaker 100 Amp (1 Pole)	3
72-074-00	Bulb, Sealed Beam, Headlamp, 36 Volt for use w/36 Volt Headlight w/o Voltage Dropping Resistor	1
72-073-00	Bulb, Sealed Beam, Headlamp, 36 Volt for use w/36 Volt Headlight w/Voltage Dropping Resistor and 24 Volt Headlight with Voltage Dropping Resistor	1
74-009-00	Charge Indicator (36 V)	1

MAINTENANCE PROCEDURES  
FRONT AXLE, STEERING, TIRES & BRAKES  
Refer to Figure 4 & 4A

Your front axle and wheel assembly consists of an axle mounted on two leaf springs with automotive spindles, steering worm, and steering linkage. It has been designed for rugged dependable service with little maintenance requirements, other than lubrication and an occasional check of all nuts and bolts for tightness. Your wheels revolve on Timken Roller Bearings and the spindles are mounted with heavy kingpins.

Zerk type grease fittings have been provided to insure proper amounts of lubricant reaching wear points.

It is recommended that you follow the maintenance guide and lubrication diagrams for normal maintenance of the assembly. They are located in Sections D and E of this manual.

The maintenance guide is set up for average use. If the vehicle is subject to long hours of running and heavy work loads the frequency of lubrication and service should be increased accordingly.

Refer to the Service and Adjustment Section J1 of this manual for guidance when performing major repairs and adjustments.

If your vehicle is equipped with 4 wheel hydraulic brakes, refer to the Service and Adjustment section of this manual under Hydraulic Brake Section J3 for their proper care and adjustments.

\*The steering worm gear box and steering linkage is similar to those used on automobiles. It requires very little attention.

Refer to maintenance guide and lubrication diagrams (Sections D & E) for normal care.

If service and adjustments are required, refer to appropriate section of this manual.

\*NOTE: Refer to Section J1A for steering worm disassemble and assemble procedures and parts information.



SERVICE AND ADJUSTMENT  
FRONT AXLE, STEERING AND TIRES  
Refer to Figure 4

WHEEL HUB REMOVAL AND ADJUSTMENTS:

1. Jack up front of vehicle until wheel is free from the ground.
2. Remove dust cap.
3. Remove cotter pin and unscrew spindle nut.
4. Remove outer washer and bearing.
5. Remove wheel hub.
6. Before re-assembly wash and clean thoroughly the bearings, spindle and hub assembly. Inspect bearings for wear or damage. Examine inner seal. Replace damaged or worn parts. Seal condition is important on models with brake assembly as grease will leak onto brake shoes and affect stopping ability.
7. Generously pack bearings with wheel bearing grease.
8. Re-assemble parts in reverse order of removal.
9. Adjust wheel bearings by tightening spindle nut until bearing drag is felt. Back off approximately 1/4 turn until wheel turns freely, but does not have play in bearings. Important note: On models utilizing front wheel hydraulic brakes, drum must be clean and dry when re-assembling. Be certain that brake shoes do not come in contact with brake drum when adjusting wheel bearings. A false feel of drag will occur and you will be unable to adjust bearings properly.
10. Install cotter pin and dust cap.
11. Wheel hub has one zerk fitting for grease lubrication.
12. Shackle bolts and spring "u" bolts should be kept tight for best steering control and least amount of wear.

REMOVE AND INSTALL KING PINS AND BUSHINGS

1. Remove wheel and hub from spindle. See preceding subsection.
2. Remove ball joints from steering arms. Remove cotter pin and nut, rap stud sharply with soft hammer, or soft block and regular hammer to loosen tapered stud from steering arm.
3. Remove 7/8 lock nut which retains spindle. See preceding subsection.
4. Remove king pin from axle. If it is necessary to force the pin from the axle, use a soft rod, such as bronze or aluminum.
5. Remove spindle and steering arm assembly, and thrust bearing, from the axle yoke.
6. Press bushings from spindle and steering arm assembly.
7. Thoroughly clean bushing housing and king pin before installing new bushings.
8. Press bushings into sleeve. It may be necessary to ream the bushings after they are installed in the sleeve because of slight distortion which may occur during the process of pressing them into place. If proper press and reamer are not available, most automotive supply houses and repair shops have the capacity to perform this service.
9. Reassemble in reverse order. Lightly oil king pin and tap into place in axle. Where it is necessary to use force to assemble components, use a soft hammer or punch.
10. After reassembly, tighten ball joints securely. Lubricate bushings and king pin through grease fitting. Adjust wheel bearings as described in preceding subsection. Align front end as described in subsection titled "Align Front End: Adjust Toe-In".

11. Perform trial lubrication on each bushing to be certain grease will travel through bushing for proper lubrication.
12. Place dust seal cap in socket with crown facing outward. Expand into place by hammering lightly on center of crown to flatten & lock into seal sockets.
13. Replace ball joints and tighten securely. Replace cotter pins. Replace wheels. Check and adjust "Toe In".

ADJUSTMENT OF "TOE IN" - To adjust toe in, jack front end of tractor off ground. With a pencil, make a mark around center of tread of tire by holding pencil point against tire and turning wheel. Mark both front wheels. Let truck down on ground. Loosen locknuts on each end of tie rod shaft so that portion of shaft between tie rod ends will turn. Next, in a straight forward position as possible, measure between marks on wheels, both front and rear side of wheel, then turn tie rod shaft until measurement is the same on both front and rear side of wheel. Retighten locknuts on each end of tie rod. Camber and caster are set at factory and so will not need resetting in the field.

REPLACE BALL JOINT:

1. Remove cotter pin, nut and loosen sleeve clamp.
2. Rap ball joint stud sharply with soft hammer or soft block and regular hammer, to loosen tapered stud from steering arm.
3. Either measure position of ball joint or count number of threads exposed from sleeve. Remove ball joint by unscrewing from sleeve. Note that one end will be left hand thread and the opposite ball joint will be right hand thread. Install new ball joint & position same as the one removed.

REPLACEMENT OF STEERING WORM:

1. Pry steering wheel cap up to expose locknuts holding horn button in place & remove 2 horn button screws.
2. Remove wiring from horn button & slide out of steering tube through bottom. Remove locknut with suitable puller & remove steering wheel.
3. Remove "u" bolt on steering tube & forward/reverse switch from column.
4. Remove ball joint at pitman arm & remove 2 steering worm holding bolts & slide steering worm assembly from bottom of vehicle.
5. Remove locknut holding pitman arm on shaft.
6. Mark position of pitman arm and remove from worm shaft.
7. If installing new steering worm, it is important to place the pitman arm in the same relative position on the new unit as it was on the old unit. Failure to do so will result in a misalignment of the steering linkage and a limitation of steering in one direction.
8. Install steering worm in the reverse manner to which it was removed outlined in steps 1 to 4.
9. When installing steering wheel, rotate the steering shaft until the front wheels are in a straight ahead position. Then place the steering wheel on the shaft aligning it in a central position.
10. Adjust any minor misalignment by loosening the steering link sleeve clamps & adjusting the steering link until the front wheel and steering wheel are both in position.
11. Check that you will be able to turn the steering mechanism equally in both directions. If you cannot, it means the pitman arm was not properly installed & it will be necessary to replace it in the proper position.
12. Lubricate steering worm through zerk fitting located on worm housing. Refer to Lubrication Diagram and Maintenance Guide - Sections D and E.

NO. DESCRIPTION

TOL. FRAC. + DEC. 1

SCALE NONE

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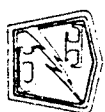
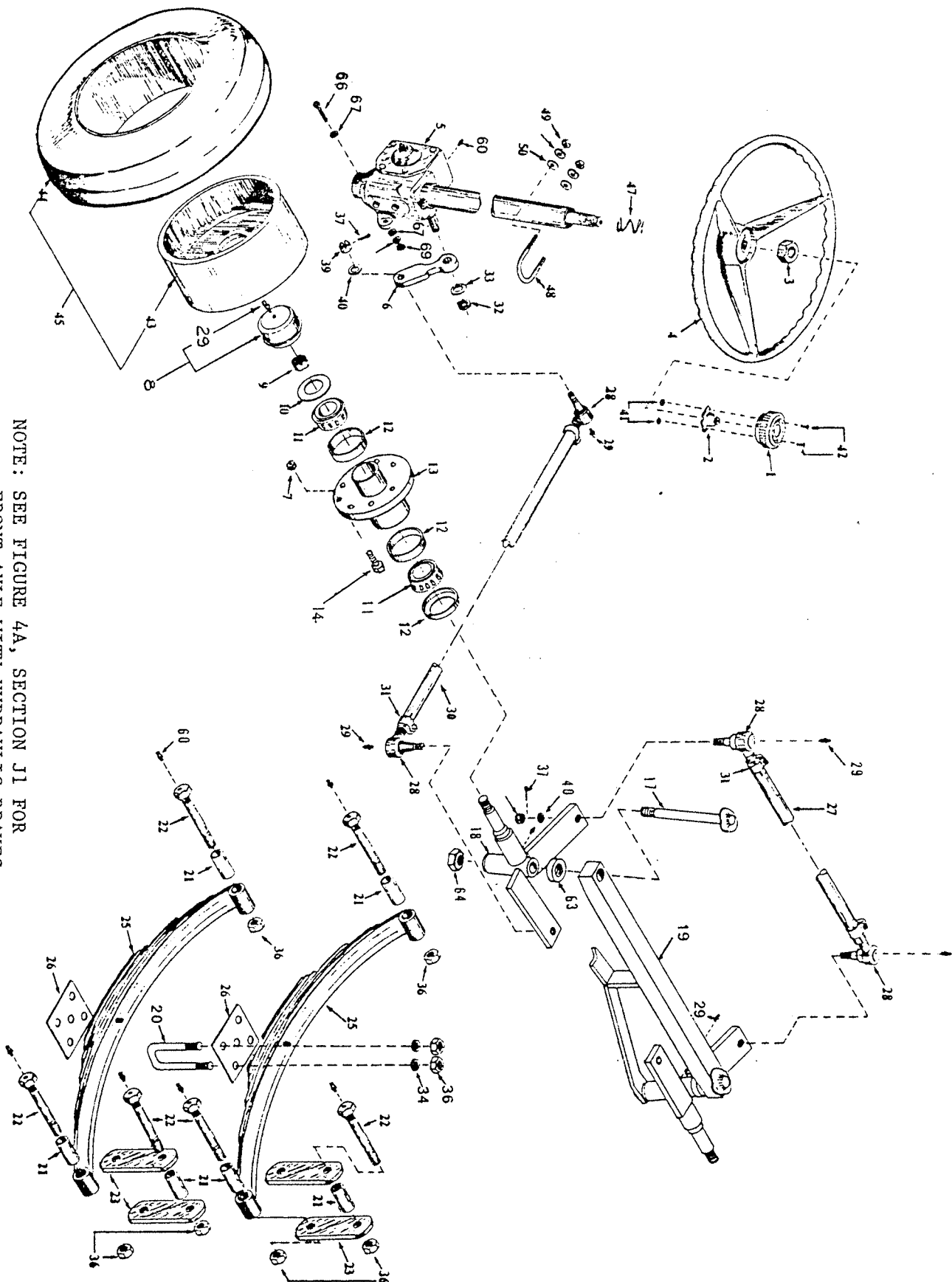
DATE 4-11-78

LENGTH QUAN. REVISED DATE REVISION

FIGURE 4  
SECTION J1

FRONT AXLE ASSEMBLY  
WITHOUT HYDRAULIC BRAKES

NOTE: SEE FIGURE 4A, SECTION J1 FOR  
FRONT AXLE WITH HYDRAULIC BRAKES.



TAYLOR DUNN MFG. CO.  
2114 West Ball Rd.  
Anaheim, Calif.

FRONT AXLE ASSEMBLY WITHOUT HYDRAULIC BRAKESFIGURE 4

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
------------------	-----------------	-------------	--------------

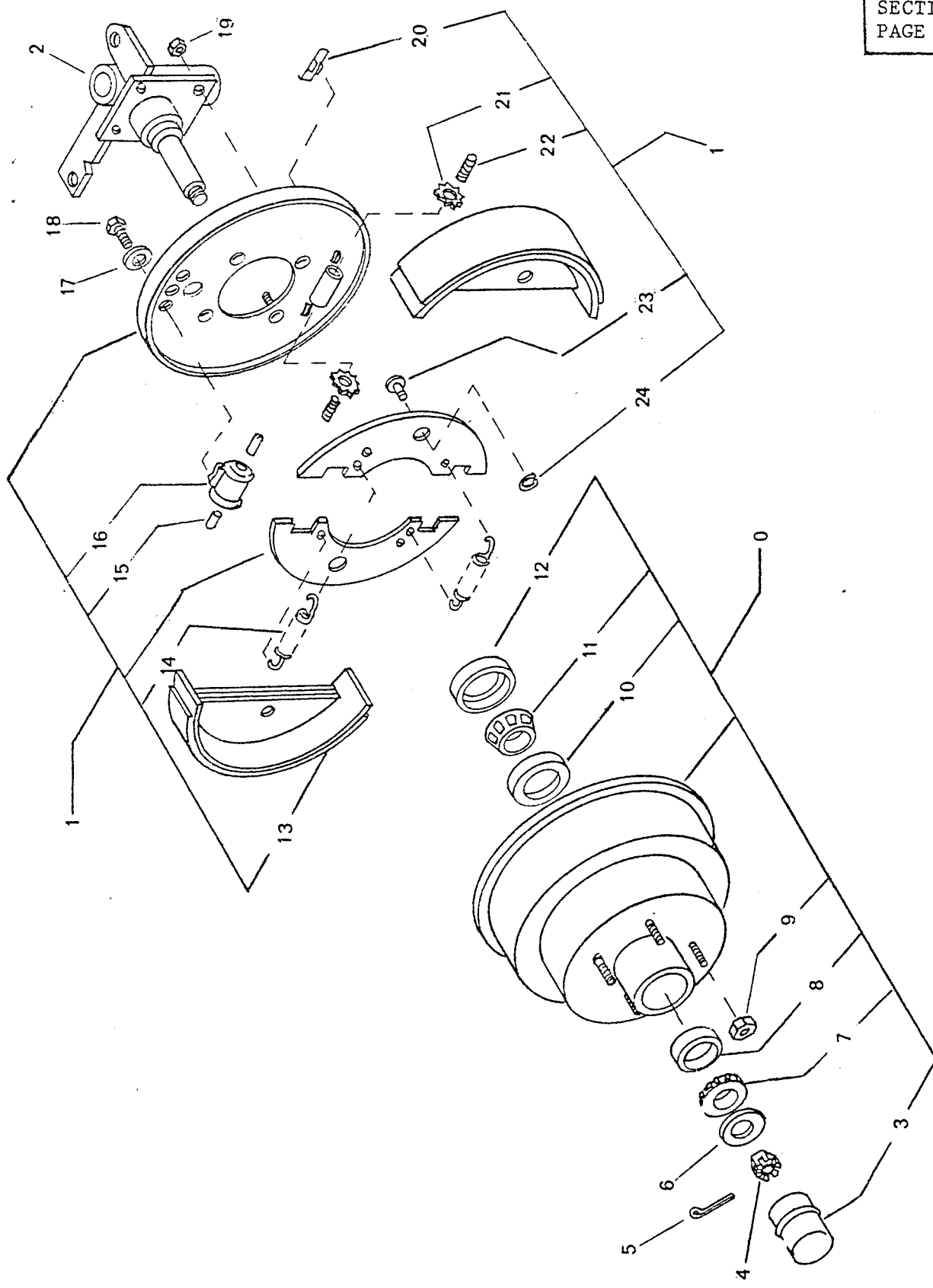
NOTE: All parts identified with asterisk (\*) are common to front axle assembly with hydraulic brakes.


*4-1	19-004-10	Cap w/Horn Button Hole (Steering Wheel)	1
*4-2	71-501-00	Horn Button (Std.)	1
*4-3	88-259-82	Jam Nut 13/16 NF (Hex)	1
*4-4	19-003-20	Steering Wheel	1
4-5	18-307-13	Steering Worm Assembly, including worm, Shaft and Jacket Tube Assembly (thru <u>Serial #44086</u> )	1
*4-5	18-307-14	Steering Worm Assembly, including worm, Shaft and Jacket Tube Assembly ( <u>Serial #44087 and up</u> )	1
*4-5	18-307-51	Steering Column Shaft & Worm Assembly	1
*4-5	18-307-52	Steering Column Jacket Tube Assembly	1
*4-6	18-107-00	Lever - Steering	1
4-7	97-236-00	1/2" Tapered Lub Nut	16
4-8	92-104-00	Dust Cap w/Grease Fitting	2
*4-9	88-239-85	Castle Nut 3/4 NF (Hex)	2
*4-10	88-228-60	3/4 SAE Washer	2
4-11	80-017-00	Tapered Roller Bearing	4
4-12	80-103-00	Tapered Bearing Race	4
4-13	12-159-00	Front Hub w/Bearing Races plus 1 Bearing & Oil Seal. Requires Purchase of 1 Add'l 80-017-00 Bearing & 92-104-00 Dust Cap. Hub has eight 1/2" NC Holes on 4-1/2" Bolt Circle	2
4-14	96-329-00	Bolt, 1/2 NF, Wheel	16
4-16	45-338-00	Oil Seal	2
*4-17	21-015-00	King Pin w/Formed Washer	2
4-18	14-161-98	Front Wheel Spindle Only (Left)	1
4-18	14-161-99	Front Wheel Spindle Only (Right)	1
4-19	15-014-11	Front Axle w/Spindles & Yoke	1
*4-20	96-121-00	U Bolt - Front Axle	4
*4-21	32-313-00	Bushing (Nylon)	6
*4-22	96-244-00	Shackle Bolt w/Grease Fitting	6
*4-23	16-870-00	Shackle Strap	4
*4-25	85-503-00	Leaf Spring Unit (21-3/4" Centers) 9 Leaf	2
*4-26	16-865-00	Spring Pad	2
*4-27	18-048-10	Steering Adjustment Sleeve Assy. w/Ball Joints and Clamps (24-1/2" Lg)	1
*4-28	86-501-98	Ball Joint (Left Hand Thread)	2

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
*4-28	86-501-99	Ball Joint (Right Hand Thread)	2
*4-29	87-074-00	Grease Fitting 1/4-28 Thread (Straight)	8
*4-30	18-053-50	Steering Adjustment Sleeve	1
*4-31	86-510-00	Ball Joint Clamp	4
*4-32	88-279-82	Jam Nut 7/8 NF (Hex)	1
*4-33	88-268-62	Lock Washer 7/8"	1
*4-36	88-149-81	Lock Nut 1/2" NC (Hex)	14
*4-37	88-527-11	Cotter Pin 1/8" x 1"	5
*4-39	88-159-85	Castle Nut 1/2" NF (Hex)	5
*4-40	88-188-61	Washer 5/8" SAE	6
*4-41	88-025-08	Truss Head Machine Screw 8-32 x 5/8"	2

NOTE: SEE SECTION J2 FOR TIRE &amp; WHEEL PARTS INFORMATION

*4-46	88-088-62	Lock Washer 5/16"	2
*4-47	85-122-00	Spring Compression (Steering Column) 1-1/8" O.D. x 1"	1
*4-48	96-102-00	"U" Bolt for Steering Column Shaft	1
*4-49	88-089-80	Nut 5/16" NC (Hex)	2
*4-50	88-088-60	Washer 5/16" Flat	2
*4-60	87-071-00	Grease Fitting (3/16 Drive) Straight	9
*4-63	80-309-00	Thrust Bearing	2
*4-64	88-279-81	7/8 Lock Nut	2
*4-66	88-130-14	Hex Head Cap Screw 7/16 x 1-1/2 NF	3
*4-67	88-128-60	Washer 7/16" Flat	6
*4-69	88-130-86	Lock Nut, Fiber Insert 7/16 NF	3



NO.		DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
TOL. FRAC. ±		DEC. ±				
SCALE		NONE				
DRAWN BY		JM				
DATE		4-7-78				
FIGURE 4A			FRONT AXLE ASSEMBLY			
SECTION J1			WITH HYDRAULIC BRAKES			
			 TAYLOR DUNN MFG. CO. 2114 West Ball Rd. Anaheim, Calif.			

FRONT AXLE ASSEMBLY WITH HYDRAULIC BRAKES

FIGURE 4A

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
(Not Shown)	15-014-13	Front Axle w/Spindles & Yoke	1
4A-0	41-515-00	Drum & Hub Ass'y Complete w/Bearings Races, Grease Seal & Lug Nuts	2
4A-1	41-342-00	Brake Back-Up Plate Ass'y w/Shoes for Right or Left Side	2
4A-2	14-162-98	Spindle Ass'y, Left Front Wheel	1
4A-2A	14-162-99	Spindle Ass'y, Right Front Wheel	1
4A-3	92-106-00	Dust Cap	2
4A-4	88-239-85	3/4" NF Hex Slotted Nut	2
4A-5	88-527-14	1/8" x 1-1/2 Cotter Pin	2
4A-6	88-228-60	3/4" Cut Washer	2
4A-7	80-015-00	3/4" Tapered Roller Bearing	2
4A-8	80-105-00	3/4" Tapered Roller Bearing Race	2
4A-9	97-236-00	1/2 NF Lug Nut	10
4A-10	80-102-00	1 1/4" Tapered Roller Bearing Race	2
4A-11	80-011-00	1 1/4" Tapered Roller Bearing	2
4A-12	45-307-00	Grease Seal	2
4A-13	41-633-00	Brake Shoe w/Lining	4
4A-14	85-212-00	Spring, Brake Shoe Return, Red Color	4
4A-15	41-683-10	Push Rod, Wheel Cylinder	4
4A-16	99-505-00	Wheel Cylinder	2
4A-17	88-068-62	1/4" Lock Washer	4
4A-18	88-060-06	1/4" x 1/2" NC Hex Head Cap Screw	4
4A-19	88-130-86	7/16" N.F. Fiber Insert Lock Nut	8
4A-20	41-684-10	Hole Cover for Brake Adjustment Cover	4
4A-21	41-680-10	Adjusting Nut, Brake Shoe	4
4A-22	41-679-10	Adjusting Screw, Brake Shoe	4
4A-23	41-695-10	Anchor Pin, Brake Shoe	4
4A-24	88-846-06	Retaining Ring, Brake Shoe Anchor Pin	4

MAINTENANCE PROCEDURES  
"FULL FLOATING" REAR AXLE, MOTOR AND BRAKES  
REFER TO FIGURE 5

Your "Full Floating" direct drive assembly is a highly efficient unit. Great care was taken in its design to promote long life with a minimum of maintenance. It employs an automotive type differential unit which operates within an enclosed housing. The gears, bearings, etc. are lubricated from within by oil which when maintained at its proper level insures complete coverage of all moving parts. This guide (Section D) and Lubrication Diagrams (Section E) of this manual. If the oil level is allowed to drop below normal limits serious damage to the differential and drive unit will result.

Although little or no adjustment of this unit will normally be required, refer to Service and Adjustment Section J2 of this manual if the need arises.

The electric motor will provide many hours of trouble free service. It is provided with sealed ball bearings which are prelubricated for their lifetime.

Periodically, the motor brushes should be inspected and cleaned. The carbon dust and dirt should be blown out of motor. When brushes are worn they should be replaced. Approx. 3000 hours operating life may be expected from a new set of brushes. To determine when to replace worn brushes, proceed as follows:

1. For motors equipped with brushes having end pigtails and side hooks, replace brush when hook is within 1/16" from bottom of hook slot.
2. For motors equipped with brushes having side pigtails only, replace brush when pigtail is within 1/16" from bottom of pigtail slot.

NOTE: When one brush is replaced in a motor, it is considered good maintenance practice to replace all brushes.

Inspect commutator for roughness or undue wear as arcing and shortened brush life will result from this condition.

Check wiring terminals for cleanliness and tightness. A loose connection will cause burning of the respective terminal and can induce motor failure.

Refer to Maintenance Guide (Section D) and Service and Adjustment (Section J2) for further recommendations on motor care.

The mechanical brake assembly located on the motor shaft will require a periodic inspection for lining wear and consequently periodic adjustment. Refer to Service and Adjustment Section J2 of this manual for proper procedures.

A few drops of oil on the clevis pin and pivot pins of the mechanical linkage is recommended on a monthly basis. Great care must be taken that no oil is allowed to contact the brake band or drum as it will seriously impair the braking ability. If the braking surfaces become oily or contaminated for any reason it will be necessary to remove the brake band and clean all parts thoroughly. Refer to the appropriate section of this manual for the correct procedure to follow.

The vehicle is equipped with hydraulic brakes, be sure to refer to Section J3 for their care and adjustment.

A periodic tightening of all bolts and nuts, especially the spring mounting "U" bolts should be made.

WARNING:

When performing maintenance on any part of the vehicle electrical system, disconnect main battery leads, place forward/reverse switch in Neutral. Remove key from keylock in dash panel.



SERVICE AND ADJUSTMENTS  
REFER TO FIGURE 5

"FULL FLOATING" REAR AXLE, MOTOR AND BRAKES

Removal of "Full Floating" rear axle and drive assembly from chassis.

1. Disconnect battery connector to prevent accidental engagement of power while servicing unit.
2. Clearly mark motor leads to insure their proper location when re-assembling.
3. Remove motor leads.
4. Pull clevis pin and disconnect brake rod from brake arm.
5. Loosen locknut and release spring tension by unscrewing turn buckle.
6. Disconnect hydraulic brake line at hose end.
7. Remove shackle bolts and nuts attaching spring to frame.
8. Remove spring eye anchor bolts.
9. Remove axle and drive assembly from chassis.
10. Install axle and drive assembly in the reverse order of removal, taking care that shackles and bushings are in good condition.  
(Replace if worn or damaged).
11. Check brake adjustments following procedures outlined in brake section J2 or J3 of this manual.
12. On models equipped with hydraulic brakes, it will be necessary to bleed the air from brake system. Follow procedure outlined in Hydraulic Brake Section J3 of this manual.

DISASSEMBLY OF "FULL FLOATING" REAR AXLE

Axle Shaft, Remove-

- Raise vehicle and place stands under housing.
- Remove axle shaft stud nuts and lockwashers.
- Strike the center of the axle shaft flange with a hammer and drift to loosen the tapered dowels, remove the dowels.
- Remove the axle shaft from the housing.

Bearing or Oil Seal, Replace

1. Remove the outer seal from the axle shaft flange studs.
2. Bend the lockwasher tab away from the locknut and remove locknut, lockwasher and adjusting nut.
3. With a wheel jack, raise the wheel to the point that all wheel weight is removed from the wheel bearings.
4. Remove the outer bearing cone and pull the wheel straight off the axle.
5. With a piece of hard wood which will just clear the outer bearing cup drive the inner bearing cone and inner seal out of the wheel hub.
6. Clean all the old grease or axle lubricant out of the wheel hub.

NOTE: If axle lubricant is found in a wheel hub that has an outer seal, it means the seal or sealing has failed and should be replaced.

7. Inspect the bearing races and rollers for pitting, galling and erratic wear pattern. Inspect the rollers for end wear.
8. If bearing cups are to be replaced, drive them out with a drift.
9. Check for proper seating of new cups by trying to insert a .0015 inch feeler gauge between the cup and the hub.
10. A ring of wheel bearing grease as high as the cup should be placed in the hub on each side of both cups. These rings form a dam which prevents thinned grease from flowing out of the bearing.
11. Pack each bearing cone and roller assembly.
12. Place the inner bearing in the wheel hub and install a new hub inner seal.
13. Adjust the wheel jack so the wheel can be installed straight on the housing without damaging the inner seal.
14. Install the outer bearing and start the bearing adjuster nut.
15. Turn the adjuster nut in and torque the nut to 50 to 80 ft. lbs. while rotating the wheel.
16. With the bearing rollers firmly seated, back off the nut  $\frac{3}{8}$  of a turn and install the lockwasher.
17. If the adjusting nut is equipped with a locking dowel, make sure that the dowel enters the lockwasher hole which closely aligns with the dowel.
18. If the lockwasher is equipped with tabs, run the locknut against the lockwasher and bend a tab over the adjusting nut.
19. Torque the locknut to 100-150 ft. -lbs.

#### Axle Shaft, Install

1. Install the seal and gaskets on the axle shaft studs.
2. Install the axle shaft, tapered dowels, lockwashers and axle shaft flange nuts.
3. Adjust the brakes.

#### Rear Axle Assembly, Replace-

Inasmuch as the axle tubes are pressed into the differential carrier to form a one-piece housing; the rear axle assembly must be removed from the chassis when it becomes necessary to overhaul the unit.

1. Raise vehicle from floor and support with stand jacks under frame side rails.

SERVICE & ADJUSTMENTS

"FULL FLOATING" REAR AXLE - Cont'd.

2. Remove rear axle unit from chassis as previously outlined.

NOTE: When replacing rear axle unit in vehicle it will be necessary to bleed air from hydraulic brake system.

Differential Carrier, Disassemble

1. Remove axle shafts as outlined previously, axle shafts may be pulled out only far enough to clear differential side gears.
2. Drain lubricant and rear cover.
3. Make sure differential side bearing caps and axle housing are marked then remove the side bearing caps.
4. Pry differential from housing.
5. Remove side bearing cups.
6. Pull off side bearing and adjusting shims, tagging shims for identification on reassembly.
7. Unfasten ring gear from case.
8. Drive out differential pinion shaft pin and pull out the shaft, pinions, and side gears.
9. Hold companion flange from turning and remove flange nut.
10. Remove motor and gear case plate.
11. Remove driven gear from pinion shaft.
12. Remove pinion from carrier by tapping on front end with soft hammer.
13. Remove pinion shaft seal.
14. Remove pinion shaft bearings from carrier, keeping separate the shim pack at each bearing.

Pinion & Bearings, Replace

If the original ring gear and pinions are being used in the original carrier, use the original shim packs at each bearing. If a new pinion or differential carrier is installed, note the markings on the end of the pinion gear on the differential carrier to obtain the correct thickness of shimming to be used with these parts. The shims behind the rear bearing establishes the correct pinion depth.

1. Press the rear pinion bearing cup to the housing with the proper thickness of shims. Press the rear pinion bearings on the shaft.
2. Install the front bearing cup and shims and front bearing.

3. Install the driven gear and, while holding the flange from turning, tighten nut to torque load of 200-220 lb. ft.
4. Check the pinion bearing pre-load with a spring scale and heavy cord wrapped around the driven gear. Pull on the spring scale. The torque required to rotate the pinion is 2 to 5 inch lbs. If not within these limits, add or remove shims from behind the front bearing to obtain the proper pre-load.
5. Remove the driven gear and install a new oil seal, flat side toward differential. Reinstall the driven gear and tighten the nut to a torque load of 200 to 220 lb. ft.
6. Replace driven gear on pinion flange and replace motor and gear case plate with gear case bolts.

#### Ring Gear, Replace

1. Install guide pins in every other hole in the ring gear. These pins can be made from  $1\frac{1}{2}$ " long cap screws with heads cut off and ends slotted.
2. Make sure back face of ring gear and face of cases are free of dirt and burrs and slip gear over pilot diameter of case.
3. Install every other ring gear bolt. Draw them up evenly and snugly so ring gear face is flush with face of case.
4. Remove guide pins and install remaining bolts.

#### Differential Carrier, Assemble

The differential bearings are adjusted by shims. These shims also establish the ring gear position with the pinion. Therefore, backlash must be checked whenever a bearing adjustment is made.

The correct bearing adjustment is one which will provide a .001 - .002" pinch fit when the differential unit is assembled into the carrier. To make the adjustment, install the bearing cones without shims and place the assembly in the housing with the bearing cups. Force the unit to one side and check the clearance between the bearing cup and differential case with a feeler gauge. When the clearance is determined, select shims of this amount plus .001 - .002" extra to establish the proper load. Remove the differential bearings again and divide the shims into two packs of equal thickness and install on each side and replace bearings.

Reinstall the unit in the carrier. This operation is made easier by cocking the bearing cups slightly when the differential is placed in the housing and then tapping them lightly with a mallet. However, when installing the differential in the housing, be sure the ring gear

Differential Carrier, Assemble (Continued)

teeth mesh with the pinion teeth before tapping the bearings in place. After the bearing cups are firmly in place, install the bearing caps. The bearing caps and gasket surface of the housing are marked with a horizontal numeral and on the other side by a vertical numeral. The position of the numerals should correspond when reinstalling the bearing caps.

Ring Gear and Pinion Backlash, Adjust

Mount a backlash gauge indicator on the carrier and start checking for the correct backlash between the right gear and pinion. If the backlash is not within the limits of .004" to .011" it will be necessary to change the arrangement of the shims back of the bearings. Make the correction in backlash bearing in mind that shims removed from one side must be installed on opposite side so that the total shim thickness of the right and left side will remain unchanged, and the bearing adjustment undisturbed.

Gear Replacement (Spur Gear Reduction)

Remove five 5/16 bolts and nuts and the three 3/8 bolts. This will allow the gear case to come apart. To remove the pinion gear, remove nut and use gear puller to pull gear. Replace new gear and lock down with nut. To replace driven gear, remove bolt and slide off splined shaft. To replace new gear slip over spline and lock nut down.

MOTOR REPAIRS:

Unless the maintenance man is properly qualified, it is advisable that the repair work be done at a qualified service station. When ordering replacement parts, give complete name plate data.

NOTE:

See SECTION J2M for disassembly of motor.

SERVICE AND ADJUSTMENT  
DEADMAN MECHANICAL BRAKE ASSEMBLY

REFER TO FIGURE 7


REMOVAL OF BRAKE ASSEMBLY AND DRUM

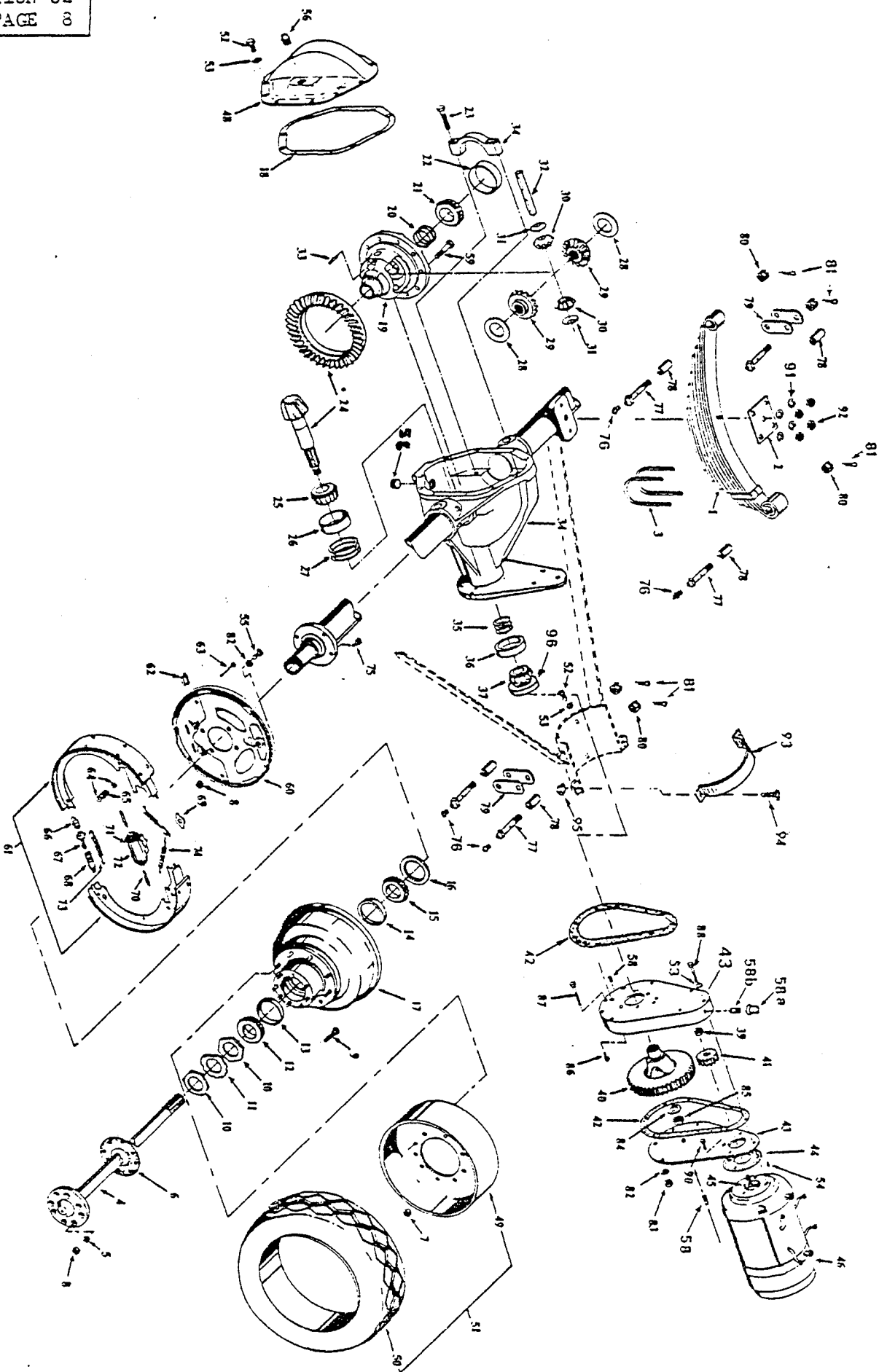
1. Remove cotter pin and clevis pin, disconnecting brake rod from brake lever arm. (note location of clevis).
2. Remove spring tension by unscrewing turnbuckle.
3. Remove bolts and cotter pin holding brake band assembly, and slide assembly off drum.
4. Band and drum may now be cleaned, inspected, and if necessary parts may be replaced as needed.
5. Brake band lining is bonded to the band for long dependable service. When it wears to approximately 1/16" thickness the band should be replaced.
6. If the brake drum is scored it should be removed and turned. It is recommended that a brake drum that has been severely scored or damaged should be replaced with a new drum.
7. To remove drum, unscrew nut, and pull drum from motor shaft.
8. Re-assemble drum on motor shaft and tighten.
9. Replace brake assembly in the reverse order to which it was removed.
10. ADJUST brake band anchor bolt and nut, tightening it until the lever arm is within 1° to 2° of being vertical.
11. ADJUST turnbuckle or eye-bolt to attain a spring length of 9-1/2" measured between spring loops at their point of contact with hooks.
12. ADJUST seat brake rod using clevis adjustment until there is 5" measured between seat stop and seat deck.  
NOTE: As brake lining wears the spring will contract in length and the seat will rise in position. Compensate for lining wear by adjusting brake band anchor bolt.
13. If vehicle is equipped with hydraulic wheel brakes, refer to Section J3 for service and adjustment.
14. Once a month lubricate four (4) bushings on seat hinge assembly.

NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
TOL. FRAC. $\frac{1}{16}$	DEC. $\frac{1}{16}$				
SCALE	MONIE				
DRAWN BY	ALINA				
CHECKED BY					

FIGURE 5  
SECTION J2

REAR AXLE,  
MOTOR AND BRAKES

 TAYLOR DUNN MFG. CO.  
2114 West Ball Rd.  
Anaheim, Calif.



"FULL FLOATING" REAR AXLE - MOTOR AND BRAKES  
REFER TO FIGURE 5

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
5-1	85-503-00	9 Leaf Spring Assembly	2
5-2	16-867-00	Spring Plate	2
5-3	96-111-00	U-Bolt	4
5-4A	41-150-00	Axle, Rear, 16 Tooth Spline	2
5-4B	41-150-50	Axle, Rear, 30 Tooth Spline	2
5-5	95-450-00	7/16 I.D. Tapered Dowel	16
5-6	45-043-00	Gasket, Axle to Hub	2
5-7	97-236-00	1/2 N.F. Lug Nut	16
5-8	88-130-86	7/16 N.F. Lock Nut, Fiber Insert 7/16 NF	24
5-9	96-332-00	Wheel Stud	16
5-10	41-870-00	Hub Outer Bearing Lock Nut	4
5-11	41-871-00	Hub Outer Bearing Lock Washer	2
5-12	80-529-00	Hub Outer Bearing	2
5-13	80-134-00	Hub Outer Bearing Race	2
5-14	80-135-00	Hub Inner Bearing Race	2
5-15	80-530-00	Hub Inner Bearing	2
5-16	45-337-00	Hub Seal	2
5-17	12-225-00	Hub Assy. w/Drum Bearing Race & Studs	2
5-18	45-041-00	Gasket	1
5-19	41-873-52	Differential Carrier Assy.	1
5-20	16-419-00	Spacer, .002 Thick	1 to 5
5-20	16-411-00	Spacer, .005 Thick	1 to 5
5-21	80-531-00	Tapered Roller Bearing (Carrier)	2
5-22	80-136-00	Bearing Race (Carrier)	2
5-23	80-140-17	1/2 x 2-1/4 NC Hex Head Cap Screw	4
5-24B	31-243-10	Ring & Pinion Gear Set, 6.17 Ratio 29 Tooth Spline	1
5-25	80-532-00	Tapered Roller Bearing (Rear Pinion)	1
5-26	80-137-00	Bearing Race (Rear Pinion)	1
5-27	16-419-00	Spacer, .002 Thick	1 to 5
5-27	16-411-00	Spacer, .005 Thick	1 to 5
5-28	41-877-00	Differential Gear Washer (Axle)	2
5-29A	41-878-00	Differential Gear (Axle), 16 Tooth Spline	2
5-29B	41-878-10	Differential Gear (Axle), 30 Tooth Spline	2
5-30	41-879-00	Differential Gear (Pinion)	2
5-31	41-880-00	Differential Gear Washer (Pinion)	2
5-32	41-881-00	Differential Gear Shaft	1
5-33	41-701-00	Pin (Differential Shaft Lock)	1
5-34	41-883-12	Housing Complete w/Gears Less Axles and Brakes	1



FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
5-35	41-884-51	Shim (.003 Thick)OPinion Bearing Shaft	1
5-35	41-884-52	Shim (.005 Thick))Pinion Bearing Shaft	1
5-36	80-138-00	Front Pinion Bearing Race	1
5-37	80-533-00	Front Pinion Bearing	1
5-39	97-241-00	3/4 NF Hex Head Jam Nut	1
5-40A	31-202-10	84 Tooth Spur Gear, 10 Tooth Hub Spline	1
5-40B	31-202-12	84 Tooth Spur Gear, 29 Tooth Hub Spline	1
5-40C	31-206-10	67 Tooth Spur Gear, 10 Tooth Hub Spline	1
5-40D	31-206-12	67 Tooth Spur Gear, 29 Tooth Hub Spline	1
5-41	31-229-00	17 Tooth Gear (goes w/84 Tooth Gear)	1
5-41	31-232-00	17 Tooth Gear (goes w/67 Tooth Gear)	1
5-42	45-000-00	Gear Case Cover Gasket	2
5-43	43-200-10	Gear Case and Cover Set	1
5-44	45-010-00	Motor Gasket	1
5-45	45-507-00	Shaft Oil Seal	1
5-46	70-061-00	Motor, 5 H.P., 2800 RPM, 36 Volt, G.E.	1
5-48	41-872-00	Carrier Cover	1
5-49	12-055-00	Cast Wheel for 18 x 5 x 14 Solid Cushion Tire	2
5-49	12-056-00	Cast Wheel for 21 x 5 x 15 Solid Extra Cushion Tire	2
5-50	10-262-00	Tire, Solid Cushion 18 x 5 x 14 (Smooth)	2
5-50	10-263-00	Tire, Solid Extra Cushion 21 x 5 x 15 (A.W.)	2
5-51	13-957-10	Tire & Demountable Wheel 18 x 5 x 14	2
5-51	13-958-10	Tire & Demountable Wheel 21 x 5 x 15 Solid Extra Cushion Tire	2
5-52	88-100-09	3/8 x 3/4 NC Hex Head Cap Screw	12
5-53	88-108-62	3/8 Lock Washer	12
5-54	97-100-00	3/16 Woodruff Key	1
5-55	88-080-09	5/16 x 3/4 NC Hex Head Cap Screw	4
5-56	41-885-00	Fill & Drain Plug - Recessed Head/Magnetic	2
5-58	41-989-00	Level or Drain Plug	2
5-58A	41-986-00	Filler Cap, Vented	1
5-58B	41-987-00	Riser Pipe	1
5-59	88-151-12	1/2 x 1-1/8 NF Hardened Hex Head Cap Screw	12
5-60	41-341-00	Brake Backing Plate for either Wheel	2
5-61	41-669-00	Brake Shoe Set for Two Wheels	1
5-62	41-684-00	Brake Adjustment Hole Cover	2
5-63	41-676-00	Anchor Rod Brake Shoe Backing Plate	4
5-64	41-677-00	Retainer Washer, Brake Shoe Backing Plate Anchor	8
5-65	85-070-00	Spring Brake Backing Plate Anchor (Fuchsia Color)	4
5-66	41-311-54	Brake Adjustment Socket	2
5-67	41-311-52	Brake Adjustment Screw	2

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
5-68	41-311-53	Brake Adjustment Nut	2
5-69	41-681-00	Top Shoe Retainer Plate	2
5-70	41-683-00	Wheel Cylinder Push Rod	4
5-71	99-503-99	Wheel Cylinder Right Side, Thru Serial #46488	1
5-71	99-505-99	Wheel Cylinder Right Side, Serial #46489 & UP	1
5-72	99-503-98	Wheel Cylinder Left Side, Thru Serial #46488	1
5-72	99-505-98	Wheel Cylinder Left Side, Serial #46489 & UP	1
5-73	85-209-00	Bottom Shoe Spring (Brown Color)	2
5-74	85-211-00	Top Shoe Spring (Red Color)	4
5-75	41-682-00	Backing Plate Mounting Bolt	8
5-76	87-071-00	Grease Fitting - 3/16 Drive Type	8
5-77	96-244-00	Shackle Bolt	8
5-78	32-213-00	Nylon Bushing	8
5-79	16-873-00	Shackle Strap	6
5-80	88-169-81	Lock Nut - 9/16" NC (Hex)	8
5-81	88-527-11	Cotter Pin - 1/8" x 1"	8
5-82	88-088-62	5/16 Lock Washer	5
5-83	88-089-80	5/16 NC Hex Head Nut	5
5-84	88-268-61	7/8 SAE Washer	1
5-85	88-279-81	7/8 NF Hex Head Lock Nut	1
5-86	88-617-09	3/8 x 3/4 Dowel Pin	2
5-87	88-080-20	5/16 x 3 NC Hex Head Cap Screw	5
5-88	88-101-20	3/8 x 3 NC Hex Head Cap Screw	3
5-89	88-108-62	3/8 Lock Washer	3
5-90	88-103-09	3/8 x 3/4 NC	
5-91	88-168-62	9/16 Lock Washer	8
5-92	88-179-85	9/16 NF Castle Nut	8
5-93	50-457-00	Motor Anchor Strap - G.E.	1
5-94	88-101-16	3/8 NC x 2 Hex Head Cap Screw (H.T.)	2
5-95	88-109-87	3/8 NC Fastite Nut	2
5-96	K9-116-10	Oil Seal, Serial No. 46489 & 46490	1
5-96	45-332-00	Oil Seal, Serial No. 46491 and Up	1

"FULL FLOATING" REAR AXLE  
SUGGESTED SPARE PARTS LIST  
REFER TO FIGURE 5

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QUANTITY OF 1-20 UNITS
5-4	41-150-00	Axle, Rear	2
5-5	95-450-00	7/16 I.D. Tapered Dowel	16
5-6	45-043-00	Gasket, Axle to Hub	2
5-7	97-236-00	1/2 NF Lug Nut	16
5-16	45-337-00	Hub Oil Seal	2
5-17	12-225-00	Hub Assy. w/Drum Bearing Race & Studs	1
5-18	45-041-00	Gasket	1
5-42	45-000-00	Gear Case Cover Gasket	2
5-44	45-010-00	Motor Gasket	1
5-45	45-507-00	Motor Shaft Oil Seal	1
5-46	70-061-00	Motor 5 H.P. 2800 RPM, 36 Volt (See Sect. J2M for Motor Parts)	1
5-51	13-957-10	Tire & Demountable Wheel 18 x 5 x 14 Solid Cushion Tire (Tractor w/18" Tire Only)	2
5-51	13-958-10	Tire & Demountable Wheel 21 x 5 x 15 Solid Cushion Extra Cushion Tire (Tractor w/21" Tire Only)	2
5-56	41-885-00	Fill & Drain Plug - Recessed Head/Magnetic	2
5-58	41-989-00	Fill Plug	2
5-58A	41-986-00	Filler Cap, Vented	2
5-58B	41-987-00	Riser Pipe	2
5-61	41-669-00	Brake Shoe Set - Two Wheels	2
5-63	41-676-00	Anchor Rod Brake Shoe Backing Plate	4
5-64	41-677-00	Retainer Washer, Brake Shoe Backing Plate Anchor	8
5-65	85-070-00	Spring Brake Backing Plate Anchor (Fuchsia Color)	4
5-70	41-683-00	Wheel Cylinder Push Rod	4
5-71	99-503-99	Wheel Cylinder Right Side	1
5-72	99-503-98	Wheel Cylinder Left Side	1
5-73	85-209-00	Bottom Shoe Spring (Brown Color)	2
5-74	85-211-00	Top Shoe Spring (Red Color)	4
5-96	45-332-00	Oil Seal, Serial No. 46491 and Up	2

MOTOR MAINTENANCE, SERVICE AND ADJUSTMENT  
ELECTRIC MOTORS  
REFER TO FIGURE 5M

Detailed service procedures covering maintenance of bearing brushes and commutator are covered in this section. DO NOT PERFORM THIS PROCEDURE WHILE BATTERIES ARE BEING CHARGED.

Maintenance of electric motors should be referred to personnel with experience and equipment. Should it be necessary for you to order replacement parts for your motor, IT IS NECESSARY TO INCLUDE COMPLETE NAMEPLATE DATA WITH ORDER.

MOTOR MAINTENANCE - BRUSH INSPECTION AND REPLACEMENT

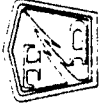
1. Remove cover, exposing brush assemblies. Lift brush from holder for inspection.
  2. If brushes are worn, remove, install new brushes. Use fine sandpaper to "seat in" new brushes to commutator. To determine when to replace worn brushes, proceed as follows:
    - a. For motors equipped with brushes having end pigtails and side hooks, replace brush when hook is within 1/16" from bottom of hook slot.
    - b. For motors equipped with brushes having side pigtails only, replace brush when pigtail is within 1/16" from bottom of pigtail slot.
- NOTE: When one brush is replaced in a motor, it is considered good maintenance practice to replace all brushes.
3. Check operation of each brush to assure that brush slides freely and does not bind in holder.
  4. Replace Cover.

MOTOR DISASSEMBLY AND REASSEMBLY

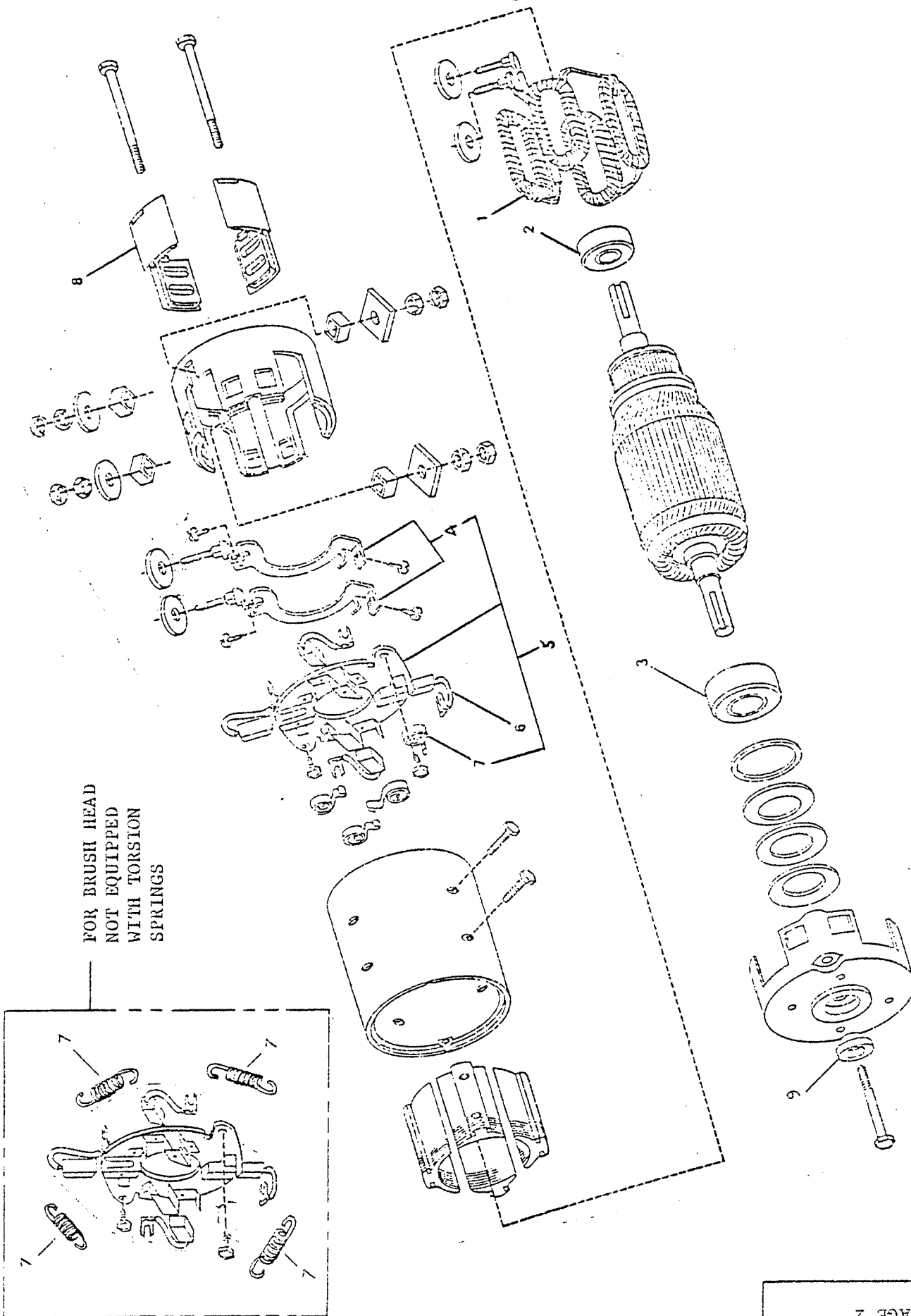
1. Remove motor from vehicle as described in section J2.
2. Determine if witness marks on end bell and stator housing are present. If not, mark end bell and housing to assure proper relation of brushes and commutator when reassembling.
3. Remove cover, exposing brush assemblies. Lift brushes from brush holder.
4. Remove bolts holding end bells and remove end bell and rotor. (Pull from shaft extension end). Take care not to damage any coils or armature wires when handling motor parts.
5. Press or pull old bearings off by using bearing press or bearing puller. Do not damage shaft while removing bearings.
6. Install new bearings onto shaft by gentle pressure or tapping with proper tool on inner race only. Bearing will be damaged if pressed or driven by outer race or seals.
7. If the commutator is worn or "burned" it should be turned, the mica undercut and the commutator polished.
8. Oil bearing housing lightly to aid in reassembly.
9. Reassemble motor taking care that all parts are kept clean.
10. Install brushes and "seat in" with fine sandpaper.
11. Check operation of each brush to assure that brush slides freely in holder.
12. Replace cover.
13. Reassemble to vehicle as described in preceding subsection.

CONNECT MOTOR LEADS AS FOLLOWS: (IMPORTANT !!)

14. a) Check that each motor terminal stud nut is tightened securely but not over-tightened as this could bend or twist the terminal post and cause an electrical short within the motor.
- b) Install motor leads on correct motor terminal post.
- c) Install a second nut on each terminal post and finger tighten.
- d) To avoid bending, twisting or breaking-off a terminal post, use a thin pattern 9/16" wrench to hold the bottom nut from moving while tightening the top nut. Carefully tighten the top nut so as to make a good connection between the terminal post and motor lead.



TAYLOR DUNN MFG. CO.  
2114 West Ball Rd.  
Anaheim, Calif.



LENGTH | QUAN. | REVISED DATE | REVISION

MOTOR PARTS - G.E. MOTORS

FIGURE 5M  
SECTION J2M

NO. | DESCRIPTION

TOL. FRAC. | DEC. |

SCALE | NONE

DRAWN BY | B.B.

DATE | 6-29-77

ELECTRIC MOTORS  
REFER TO FIGURE 5M

For D.C. Motor replacement parts, IT IS NECESSARY TO INCLUDE COMPLETE MOTOR NAME PLATE DATA WITH THE ORDER.

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY.
------------------	-----------------	-------------	------

Replacement Parts for G.E. Motor 5BT1326A96

5M-2	80-504-00	Ball Bearing, Commutator End	1
5M-3	80-206-00	Ball Bearing, Shaft End	1
5M-5	70-170-00	Brush Holder Assembly	1
5M-6	70-112-00	Dual Motor Brush, One Terminal	4
5M-7	85-398-00	Brush Spring	8
5M-9	45-507-00	Oil Seal	1

Replacement Parts for G.E. Motor 5BT1326B96

5M-2	80-504-00	Ball Bearing Commutator End	1
5M-3	80-206-00	Ball Bearing, Shaft End	1
5M-5	70-171-00	Brush Holder Assembly	1
5M-6	70-112-00	Dual Motor Brush, One Terminal	4
5M-7	85-398-00	Brush Spring	8
5M-9	45-507-00	Oil Seal	1

MAINTENANCE PROCEDURES  
HYDRAULIC BRAKE SYSTEM  
Refer to: Figure 6 and 7

Your hydraulic brake system consists of an automotive master cylinder, located under the left front floorboard. It is operated by the brake foot pedal and control linkage.

Each rear wheel is fitted with a 12" brake assembly; and rugged brake drum. On 4 wheel brake models the front wheels are equipped with 8½" brake assembly.

Refer to Maintenance Guide Section D and Lubrication Diagram Section E for proper lubrication and frequency of inspection.

Master cylinder fluid level should be checked monthly. Add fluid needed to maintain level 3/8" to 1/2" from top of fill port. Use only approved hydraulic brake fluid.

A visual inspection of the hydraulic system is recommended on a monthly basis to detect any signs of leakage. Repairs should be made immediately if leakage is discovered.

A spongy action on brake pedal or a low engagement point on the pedal usually indicates air entrapment or the need of shoe adjustment. Refer to Service and Adjustment Section J3 of this manual for proper procedures to follow.



SERVICE AND ADJUSTMENTS  
HYDRAULIC BRAKE SYSTEM  
Refer to: Figure 6 & 7

The loss of brake pedal action may be due to a defective master cylinder. It can usually be detected by signs of fluid leakage at master cylinder or by the action of the brake pedal. When foot pedal pressure is applied you will feel the brakes engage, yet, the pedal will continue to travel downward. A ruptured hydraulic line or a defective wheel cylinder will produce the same action. You can determine the cause by the location of brake fluid leakage.

MASTER CYLINDER REPAIR OR REPLACE

1. Remove cotter pin, clevis pin, and remove push rod. (It will slide out of the master cylinder socket).
2. Disconnect hydraulic line at cylinder. (There will be 2 lines on 4 wheel brake system).
3. Remove 2 holding bolts and lift master cylinder out of chassis.
4. Cylinder should be thoroughly cleaned.
5. Remove boot and locking ring. Note: Piston parts are under spring pressure, take care that they do not pop out when you remove lock ring.
6. Remove piston and cup assembly.
7. Inspect cylinder wall. If scoring or roughness is present it must be removed with a fine hone.
8. Taking care that all parts are kept clean, install new piston and cup assembly kit. A diagram is furnished with each kit. It is also recommended that parts are coated with a small amount of brake fluid prior to assembly.
9. Replace lock ring and boot.
10. Install cylinder in chassis in reverse order to which it was removed.
11. ADJUST push rod by loosening locknut and shortening or lengthening the rod so that when brake pedal is fully raised the push rod should be with 1/16" of contacting piston socket. A good way to be certain is to remove clevis pin. While lightly holding rod against socket (DO NOT PUSH HARD ENOUGH TO MOVE PISTON) observe the alignment of clevis and hole. When correct you will have to pull rod approximately 1/16" out of socket to insert clevis pin.
12. Tighten locknut and install cotter pin.

### BLEED AIR FROM BRAKE SYSTEM

Note: Anytime that any part of the hydraulic system is disconnected or replaced, it is necessary to bleed air from system.

If fluid level is allowed to fall too low in master cylinder reservoir, air will be pumped into system. Consequently the system will have to be bled to remove air. To bleed air from system, follow procedure outlined next.

1. For best results brake shoes should be properly adjusted prior to bleeding system. (Refer to Adjustment Section J3 of this manual).
2. Fill master cylinder to top with approved brake fluid or, if available, attach brake bleeder tank to master cylinder.
3. When using bleeder tank, loosen air bleeder valve (located at each wheel cylinder), one at a time. Allow fluid to flow until air pockets and bubbles stop and a clear stream appears.
3. (Alternate) It is necessary to utilize 2 people to bleed brake system when a bleeder tank is not available. One person will operate brake pedal and add fluid to master cylinder as needed. The other person will operate bleeder valves. While one person applies brake pedal pressure, loosen bleeder valve. Fluid and air will be forced out on the downward stroke of the pedal. Person operating pedal must hold it down at the end of its stroke while the other person closes bleeder valve. If pedal is raised while bleeder valve is open, air will be drawn back into the system. By coordinating the movements of the two people air will be bled out on each downward stroke of the pedal. It is wise to refill master cylinder after every 3 or 4 strokes to insure against any air being drawn in because of the reservoir level being too low. Usually 2 to 4 strokes per wheel cylinder is sufficient to remove air from system.
4. Remove brake bleeder tank if used. Fill master cylinder 3/8" to 1/2" of top and replace cover.

### REPLACING WHEEL CYLINDERS OR BRAKE SHOES

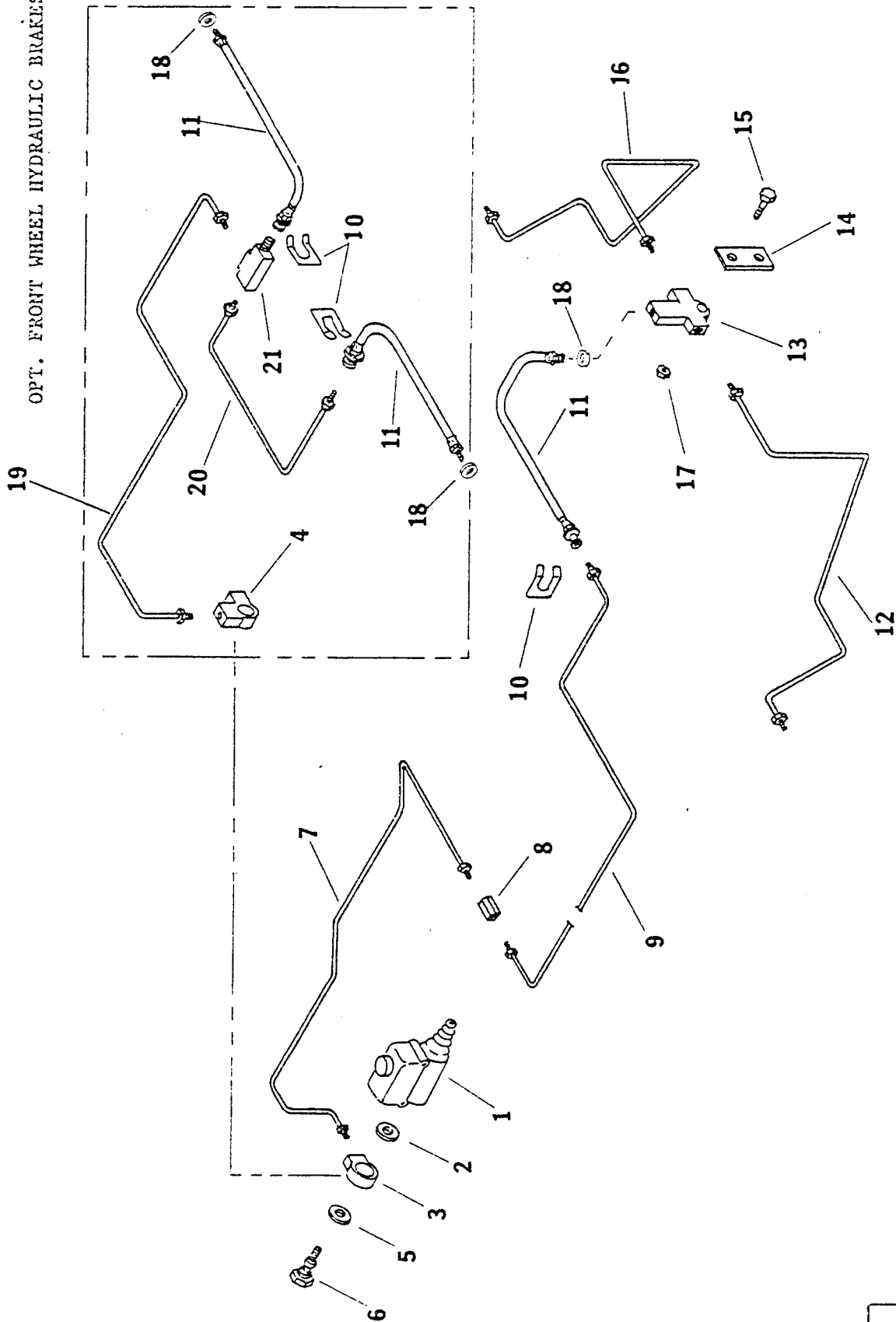
1. Remove wheel lugs, wheel and brake drum.
2. Unhook springs and remove brake shoes. Brake shoes should be replaced when lining is worn to rivet heads.
3. To remove wheel cylinder, disconnect hydraulic line.
4. Remove 2 wheel cylinder bolts from backing plate and remove wheel cylinder.
5. If installing replacement kit, clean wheel cylinder thoroughly.
6. Remove dust caps and piston parts.
7. Examine cylinder walls. If scored or rough, remove with fine hone.

8. Install new kit assembly.
9. Replace wheel cylinder and brake shoes in reverse order to which they were removed.
10. Replace brake drum. (If brake drum is badly scored, replace with new one).
11. Replace wheel.
12. Adjust brake shoes and bleed hydraulic system.

ADJUST BRAKE SHOES  
Refer to Figure 5

1. Jack wheels clear of floor.
2. Remove adjusting hole covers.
3. Insert screwdriver or special adjusting tool in slot of backing plate to engage star wheel adjusting screw.
4. Move outer end of tool toward axle, expanding brake shoes to a point where the wheel drags heavily.
5. Then back off by turning adjustment star in opposite direction slightly until wheel is just free.
6. Repeat procedure on opposite wheel.
7. Depress brake pedal several times and check to be sure wheel still revolves free of drag and desired pedal travel is obtained.
8. If wheel drags, repeat adjustments as previously outlined, until satisfactory results are obtained.
9. If wheel (or wheels) are free of drag, but pedal has too much travel, check adjustments as previously outlined. If necessary, bleed hydraulic system.

OPT. FRONT WHEEL HYDRAULIC BRAKES



SECTION J3  
PAGE 5

SECTION J3  
PAGE 5

LENGTH QUAN REVISED DATE REVISION

NO. DESCRIPTION

TOL. FRAC. DEC. +

SCALE NONE

DRAWN BY JIM

DATE 5-5-78

# HYDRAULIC BRAKE SYSTEM

2 AND 4 WHEEL

TAYLOR DUNN MFG. CO.  
2114 West Ball Rd.  
Anaheim, Calif.

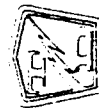


FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
6-1	99-510-00	Master Cylinder	1
6-1	99-510-61	Kit, Master Cylinder Repair	0
6-2	99-571-00	Gasket, Copper, 13/16 OD x 1/2 ID x 1/32	1
6-3	99-566-00	Fitting, Master Cylinder, one 3/16 Tube Seat, used only with two wheel brakes	1 or 0
6-4	99-565-00	Fitting, Master Cylinder, two 3/16 Tube Seats, used only with four wheel brakes	0 or 1
6-5	99-572-00	Gasket, Copper, 13/16 OD x 19/32 ID x 1/32	1
6-6	99-579-00	Bolt, Hydraulic Swivel Fitting, Hex Head	1
6-7	99-609-52	Tube and Nut Assy., 3/16, Steel, Master Cylinder to Rear Axle Line Union	1
6-8	99-575-00	Union, 3/16 Tube	1
6-9	99-608-55	Tube and Nut Assy., 3/16, Steel, Line Union to Rear Hose	1
6-10	99-576-00	Clip, Hydraulic Hose	1 or 2
6-11	99-580-00	Hose Assembly	1 or 3
6-12	99-605-52	Tube and Nut Assy., 3/16, Steel, Rear Axle Tee to Left Rear Wheel Cylinder	1
6-13	99-563-00	Tee, Rear Axle	1
6-14	99-557-00	Bracket, Rear Axle Tee Mounting	1
6-15	88-060-11	Screw, Hex Head, 1/4-20 NC x 1	1
6-16	99-605-53	Tube and Nut Assy., 3/16, Steel, Rear Axle Tee to Right Rear Wheel Cylinder	1
6-17	88-069-87	Nut, Hex Fastite, 1/4-20 NC	1
6-18	99-570-00	Gasket, Copper, 37/64 OD x 25/64 ID x 1/32	1 or 3
6-19	99-605-54	Tube and Nut Assy., 3/16, Steel, Master Cylinder to Front Tee	0 or 1
6-20	99-604-54	Tube and Nut Assy., 3/16, Steel, Front Tee to Left Front Hex	0 or 1
6-21	99-559-00	Fitting, Two 3/16 Tube Seats, one male thread 3/16 INV.	0 or 1

MAINTENANCE PROCEDURES  
MECHANICAL CONTROL LINKAGE  
Refer to Figure 7

The mechanical control linkage operates the various controls and mechanisms located throughout your vehicle.

The accelerator system consists of the operating pedal and pivot shaft assembly, the connection rods and adjusters and the return spring. All wear points should be lubricated monthly for normal service. Refer to Maintenance Guide - Section D and Lubrication Diagram Section E for proper application of lubricants.

The handbrake system consists of the hand operated lever, pivot shaft, connecting rod, and adjuster and the mechanical brake operating cable. (Note that on vehicles equipped with mechanical brakes only, this cable serves as the operating cable for the foot brake system as well.

The hydraulic footbrake system consists of the foot pedal, pivot shaft, return spring, and the master cylinder and push rod assembly.

The automatic deadman brake system consists of the pivoted seat assembly, the operating cable or rods, the brake apply spring, adjustable tension device and its connecting linkage.

All wear points should be lubricated monthly. Refer to Maintenance Guide - Section D and Lubrication Diagram Section E for proper application of lubricants.

NO.	DESCRIPTION
TOL. FRAC. ±	DEC. ±
SCALE	
DRAWN BY	J.M.

SECTION J4  
FIGURE 7

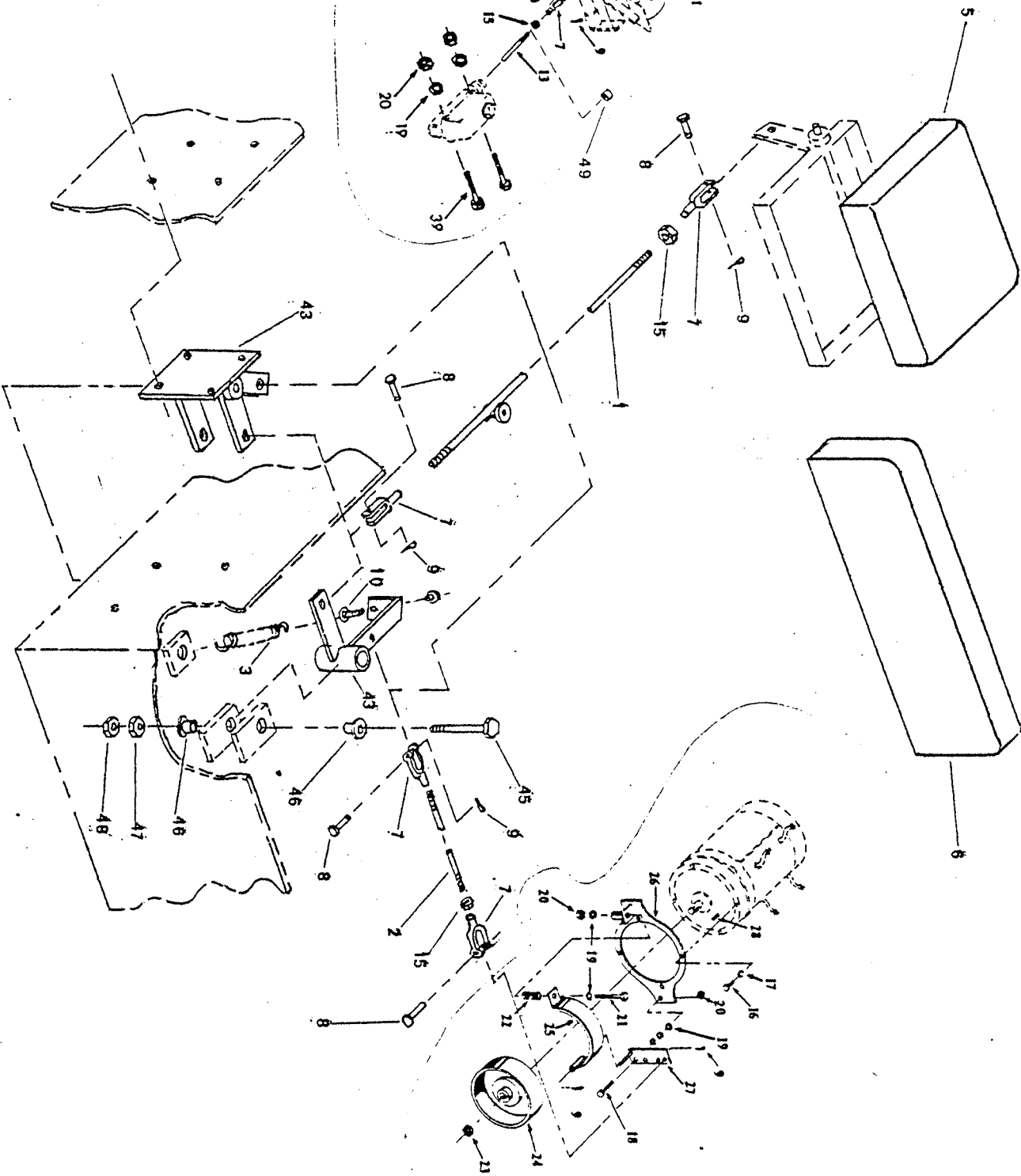
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MECHANICAL CONTROL LINKAGE

MODEL 1256B



TAYLOR DUNN MFG. CO.  
2114 West Ball Rd.  
Anaheim, Calif.



MECHANICAL CONTROL LINKAGE  
REFER TO FIGURE 7

FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
7-1	50-126-00	3/8 Rod, 82-1/4" Long	1
7-2	50-127-00	3/8 Rod, 19" Long	1
7-3	85-280-00	Spring Deadman Brake Return	1
7-4	85-295-00	Spring Accelerator Return	1
7-5	90-001-00	Seat Cushion (Thru Ser. #44087/up)	1
7-5	90-168-00	Seat Cushion (Ser. #30705 to 44086)	1
7-6	90-140-00	Seat Backrest	1
7-7	96-762-00	3/8 Clevis	3
7-8	96-772-00	3/8 Clevis Pin	3
7-9	88-527-11	1/8 x 1 Cotter Pin	7
7-10	96-202-50	Eyebolt, 3/8 x 2-1/2 (Ser. #44087/up)	1
7-10	96-926-00	Turnbuckle, (Ser. #30705 to 44086)	1
7-11	98-200-00	Pad Rubber Brake Pedal	1
7-12	98-254-00	Pad Accelerator Pedal	1
7-13	50-009-00	Master Cylinder Push Rod	1
7-14	85-270-00	Brake Return Spring	1
7-15	88-119-80	3/8 NF Hex Head Nut	3
7-16	88-100-11	3/8 x 1 NC Hex Head Cap Screw	4
7-17	88-108-62	3/8 Lock Washer	4
7-18	88-100-13	3/8 x 1-1/4 NC Hex Head Cap Screw	1
7-19	88-108-60	3/8 Cut Washer	10
7-20	88-109-81	3/8 NC Lock Nut	4
7-21	88-100-24	3/8 x 4 NC Hex Head Cap Screw	1
7-22	85-060-00	Spring	1
7-23	88-239-82	3/4 NF Jam Nut	1
7-24	41-520-10	Brake Drum	1
7-25	41-650-00	Brake Band	1
7-26	70-452-00	Brake Mounting Plate	1
7-27	42-001-51	Brake Cam	1
7-28	97-100-00	3/16 Woodruff Key	1
7-29	88-060-11	1/4 x 1 NC Hex Head Cap Screw	2
7-30	88-069-80	1/4 NC Hex Head Nut	4
7-31	88-068-60	1/4 Cut Washer	3
7-32	88-065-09	1/4 x 3/4 NC Machine Screw Truss Head	2
7-34	88-837-09	#14 x 3/4 Phillips Pan Head Sheet Metal Screw	8
7-35	87-071-00	Zerk Grease Fitting	8
7-36	71-609-00	Bracket-Micro Switch Brake Pedal Interlock	1
7-37	88-014-13	Round Head Machine Screw 6-32 x 1-1/4"	2
7-38	88-019-80	Nut 6-32 (Hex)	2
7-39	88-101-18	Hex Head Cap Screw 3/8" NC x 2-1/2"	2




FIG. I.D. NO.	T-D PART NO.	DESCRIPTION	QTY. REQ.
7-40	88-068-62	Lock Washer 1/4"	2
7-41	71-130-00	Micro Switch (Standard)	1
7-42	50-015-00	Accelerator Rod - 3/8" x 3-3/4" Long Plus Bend	1
7-43	50-649-10	Bell Crank (Ser. #44087/up)	1
7-43	50-649-00	Bell Crank (Ser. #30705 to 44086)	1
7-45	88-140-25	Hex Head Cap Screw, 1/4" NC x 4-1/2"	1
7-46	32-215-00	Bushing, Flanged Plastic, 1/2 I.D.	2
7-47	88-149-80	Hex Nut, 1/2 NC	1
7-48	88-149-81	Hex Lock Nut, 1/2NC	1
7-49	17-104-00	Collar, 3/8" Shaft	1

## MODULE SETTINGS BY VEHICLE

VEHICLE	MOTOR	HP @ 36	24V	BATT VOLT	CONT MODULE	CONTACTOR PANEL	EV-1 SCR CONTROL	MODULE SETTINGS	FW
MODEL	2/1.5	3.5/2.25	5/3.5	24 36 48	EV-1A EV-1B	75A 150A	CREEP C/A C/L	1A TIME DO	PLUG PU
B 2-48	X			X	X	X	7 3 9	7 2-1/2 7-1/2	5
B 2-48		X		X		X	6 5 9	3 3 7	5
B 2-54			X	X	X	X	6 4.5 9	4 2.5 5	5
B 2-56			X	X	X	X	6 5 9	5 3.5 5	5
E 4-51		X		X	X	X	8 3 9	7 3 4	5
E 4-53			X	X	X	X	7 5 9	5 3.8 5	5
E 4-53		X		X	X	X	6 5 9	3 3 5	5
E 4-57			X	X	X	X	7 5 9	5 3.8 5	5
E 4-57		X		X	X	X	6 5 9	3 3 5	5
P 2-49			X	X	X	X	5.5 5 9	5 3.8 4.4	5
P 2-50			X	X	X	X	5.5 5 9	5 3.8 4.4	5

GENERAL ELECTRIC SERVICE INFORMATION BULLETIN

 <b>GENERAL ELECTRIC</b>	<b>EV-1™ SCR CONTROL</b>	<b>SERVICE INFORMATION</b>	
		EV-1 Card Damage	
		Subject _____	
		Number <u>80-1</u>	Date <u>5/14/80</u>

As the number of EV-1 controls in use grows, so do the variety of application and maintenance procedures. This letter will list five specific situations which could cause damage to the EV-1 oscillator card. In all of these cases, the card should be replaced, the symptom confirmed and the cause eliminated.

1. Inadvertently apply battery positive to the R6 terminal of the oscillator card with the 1A switch open. This can easily be done by incorrect wiring of the 1A switch versus the start switch. This will cause internal damage to the card.

The SYMPTOM that would surface in this case is the bypass (1A) function will not operate.

2. Inadvertently apply battery positive to R4 or R5 or R6 terminals of the oscillator card with the 1A switch closed and/or the accelerator pot in the top speed position (min. ohms). This will cause internal damage to the card or the 15 amp control fuse will blow.

The SYMPTOM that will surface is the 1A/FW contactors pick up when the key switch is closed. If the control fuse opened, then the control will be inoperative.

3. Apply hi-pot voltage (500-1300 volts AC) with as low as 20 milliamps current draw to L3 on the EV-1 oscillator card. This is accomplished by Hi-Potting the vehicle with the oscillator plugged in and an existing short in the control circuit or the truck frame. Realize, that any short to frame in any of the control switches or wiring will cause this problem if the vehicle is Hi-Potted.

Certain components on the card will be damaged and also possibly the 5REC, 2REC, 1REC and 3REC.

The SYMPTOM in the case of damage to the 1, 2 or 5 REC's will be no output to the PMT driver and, therefore, no pickup of the Forward and Reverse contactor. If the 3REC is damaged, the power fuse should blow.

Should this situation occur (after Hi-Potting), the short should be eliminated. EV-1 controls are rated to withstand hi-pot voltages of 1300 volts A.C. The truck (or control) may be hi-potted without damage to the control, if the attached procedure on hi-potting is followed.

4. Forgetting to connect the 14 pin connector in the rear of the oscillator card and applying power will damage certain card components.

The SYMPTOM in this case will be no 1A function.

™Trademark of General Electric Company

The information contained herein is intended to assist truck users and dealers in the servicing of SCR control furnished by the General Electric Company. It does not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance.

Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, the matter should be referred to the truck manufacturer through his normal service channels, not directly to General Electric Company.

5. Probably the most common of these five situations, plugging a working battery charger into the control and closing the key switch will damage the EV-1 card through terminal L3.

The SYMPTOM in this case is that the truck will not run and in many cases, the situation will be obvious as much smoke and fumes will be evident.

If the truck doesn't run with no visual evidence of card damage, confirm this situation by checking voltage at card terminal R1 (with respect to battery negative) and the key switch closed: Damage caused by a battery charger will cause a reading of 0 volts at this point.

The portion of the card damaged in this case is the power supply.

Other printed circuit cards such as the Battery Discharge Indicator can be damaged also.

Attached find a sketch of a suggested modification that can be made in order to prevent plugging the charger into the control.

It should be noted that all five of these conditions may invalidate warranty considerations.

Cosmo Mirra  
Cosmo Mirra

Joe Nash/cm  
Joe Nash

/gm

Tennis



EV-1 HIGH POTTING PRECAUTIONS

- A. Protect the SCR panel components from ground fault paths by the following procedure:
- 1) Short all five SCR power terminals together; A1-NEG-A2-T2-POS
  - 2) Short capacitor terminals together
  - 3) Remove main control card and accessory cards

NOTE: It is important to remember that the practice of shorting SCR terminals/ capacitor and removing oscillator card is done to protect electronic components should a hi-pot failure exist anywhere on the truck.

- B. Hi-pot positive and negative to frame using a hi-pot tester with 15 milliamps or better current capacity.

Hi-pot current draw can be broken down in three paths:

- 1) 3.5 to 5 MA is the typical draw for EV-1 SCR panel. The larger the panel size, the greater the current draw.
- 2) Current draw in a traction motor normally is in the 4 to 5 MA range.
- 3) The remainder of truck will make up the rest of current draw.

Clear any faults and continue testing until circuit will hold up hi-pot voltage in test B above.

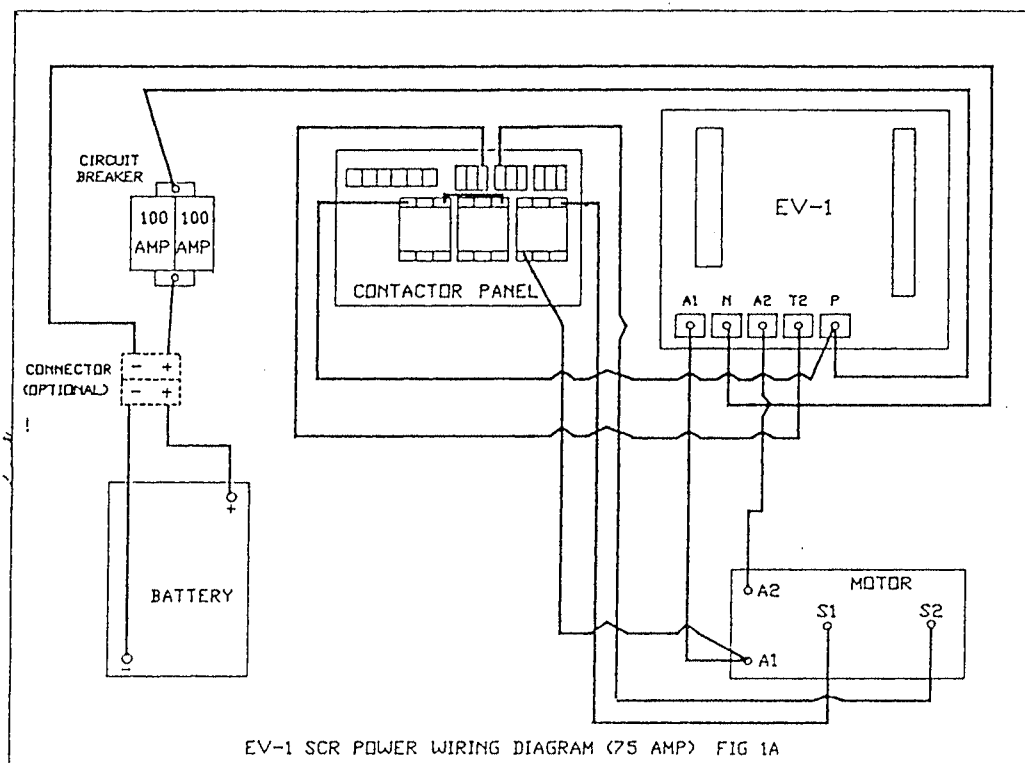
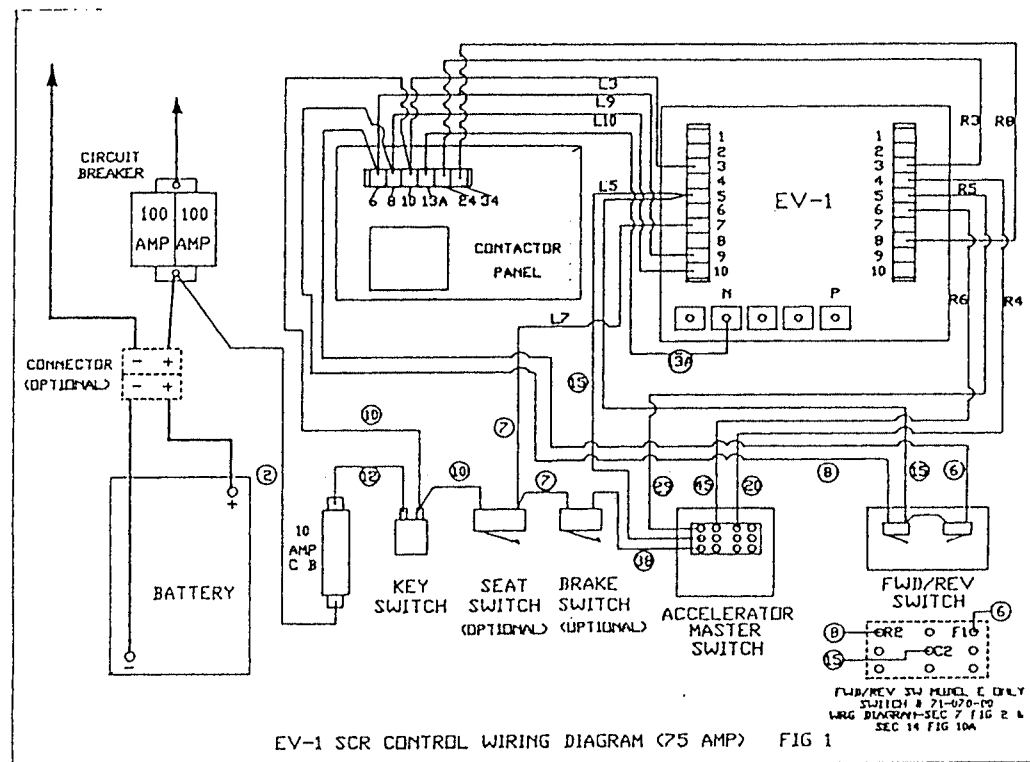
- C. This procedure is suitable for preparation for the U.L. dielectric test.
- D. Warranty is voided unless this procedure is followed.

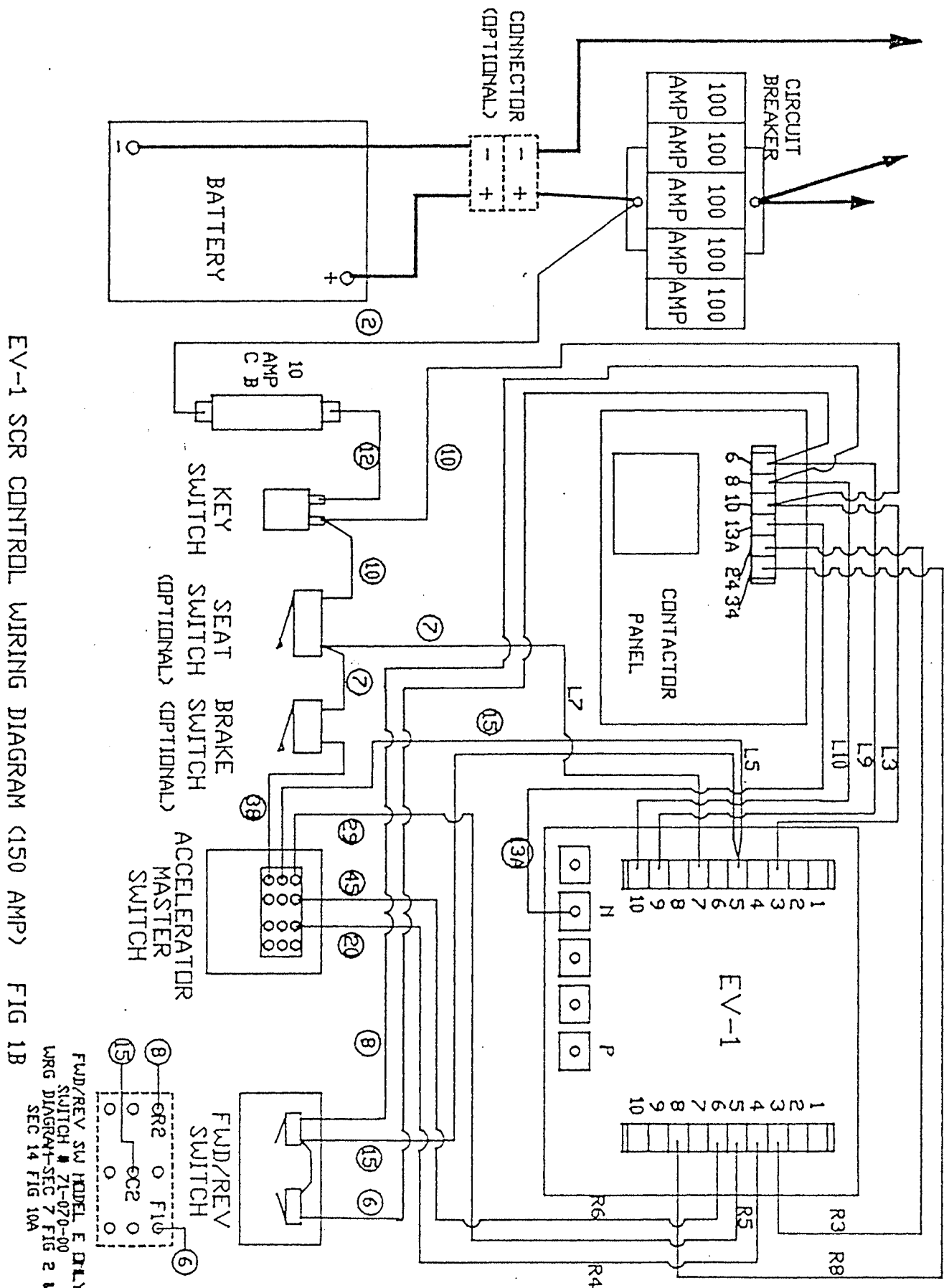
<p>SKJMDB2179-A1</p> <p>CONT ON SHEET FL. SH NO. 1</p>		<p>TITLE</p> <p>FIRST MADE FOR</p>	
<div style="position: absolute; top: 10%; left: 10%;"> <p>CABLES TO BATTERY CHARGER</p> </div> <div style="position: absolute; top: 25%; left: 25%;"> <p>ANDERSON PLUG</p> </div> <div style="position: absolute; top: 25%; left: 55%;"> <p>SEE SKETCH A</p> </div> <div style="position: absolute; top: 30%; left: 55%;"> <p>2.5 INCH LONG 1/4 INCH DIA. H.W.D. QTY 2</p> </div> <div style="position: absolute; top: 45%; left: 25%;"> <p>ANDERSON PLUG</p> </div> <div style="position: absolute; top: 45%; left: 50%;"> <p>TRUCK FRAME</p> </div> <div style="position: absolute; top: 55%; left: 25%;"> <p>CABLES TO CONTROL</p> </div> <div style="position: absolute; top: 75%; left: 25%;"> <p>LOCATIONS TO MATCH ANDERSON PLUG (CLEARANCE FOR 1/4")</p> </div> <div style="position: absolute; top: 75%; left: 65%;"> <p>ANY NON-CONDUCTING MATERIAL (IE) WOOD, PLASTIC, PRESSED FIBER, ETC.</p> </div> <div style="position: absolute; top: 85%; left: 55%;"> <p>SKETCH A</p> </div>			
<p>MADE BY</p> <p>JOYCE M. DUNBAR</p> <p>ISSUED</p>		<p>APPROVALS</p> <p><i>[Signature]</i></p> <p>INDUSTRIAL CONTROL</p> <p>CHADLOTTEVILLE VA.</p>	
<p>DIV OR DEPT.</p> <p>LOCATION</p>		<p>SKJMDB2179-A1</p> <p>CONT ON SHEET FL. SH NO. 1</p>	

REVISION

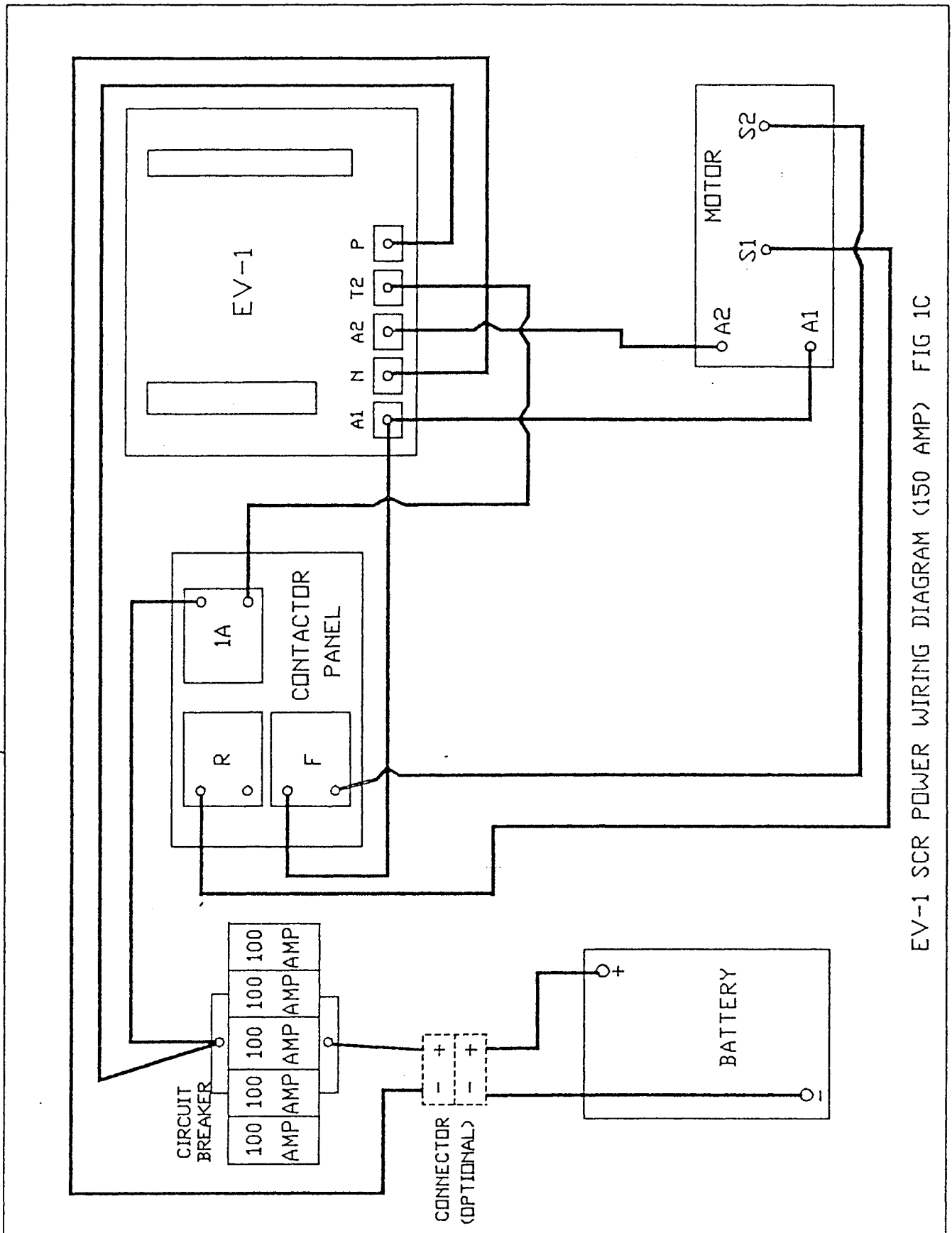
PRINTS

WIRING DIAGRAMS

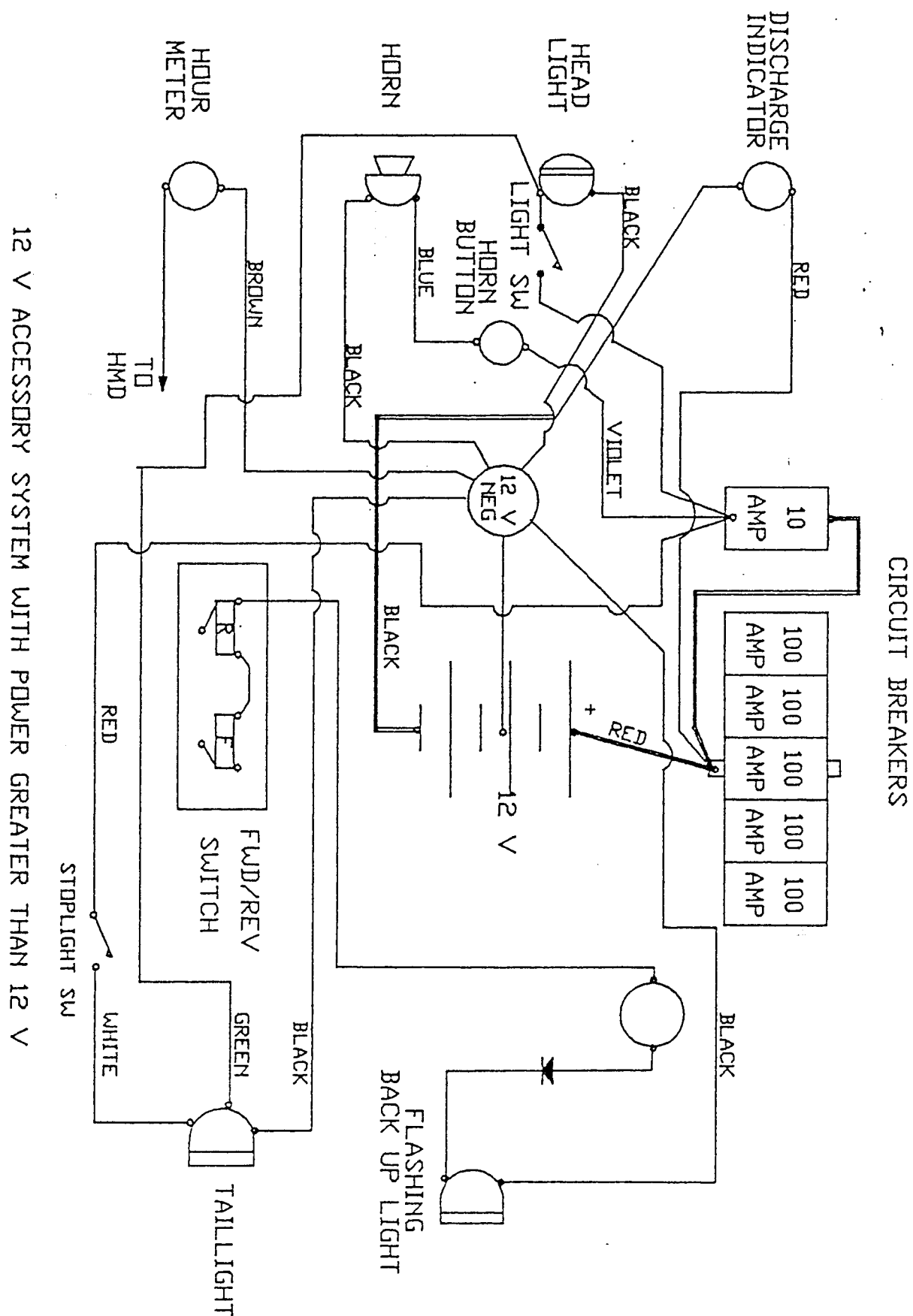




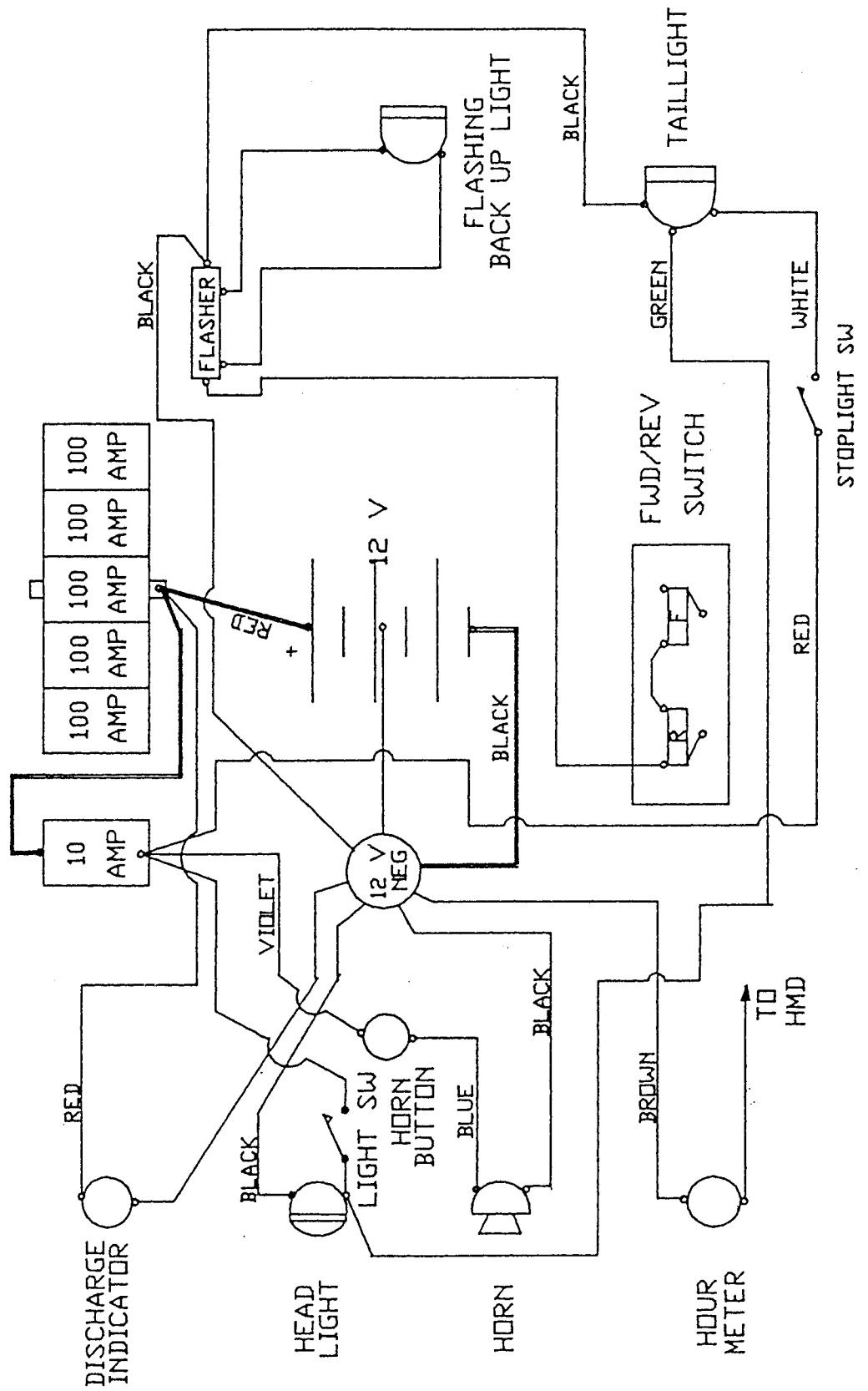




EV-1 SCR POWER WIRING DIAGRAM (150 AMP) FIG 1C



CIRCUIT BREAKERS



12 V ACCESSORY SYSTEM WITH 12 V POWER SYSTEM



SERVICE AND ADJUSTMENT  
EV-1 FORWARD/REVERSE SWITCH  
REFER TO FIGURE 3

**CAUTION:** Whenever service work is to be conducted on the switch or any part of the vehicle wiring system, disconnect the positive lead at the battery or unplug power leads on vehicles so equipped.

REPLACEMENT OF MICROSWITCH

1. Remove (1) screw from center of handle and hub assembly. Remove handle and hub assembly from cover.
2. Remove (2) screws attaching cover to frame. Remove cover from frame.
3. Carefully note the position of wires and mark their respective locations.
4. Remove switch terminal screws and wires.
5. Remove (2) screws attaching switch to frame assembly.
6. Install new switch, replacing screws and wires in reverse order. Switch position retaining screws should be snug, not tight, for the moment.
7. With switch roller riding on top of cam lobe, insure that .010" clearance exist between roller arms and switch body, and tighten switch retaining screws.
8. Insure that replaced switch operates correctly in "NC" and "NO" positions.
9. Check adjoining switch for correct adjustment.
10. Replace cover and handle assembly in reverse order.
11. Check for proper operation.

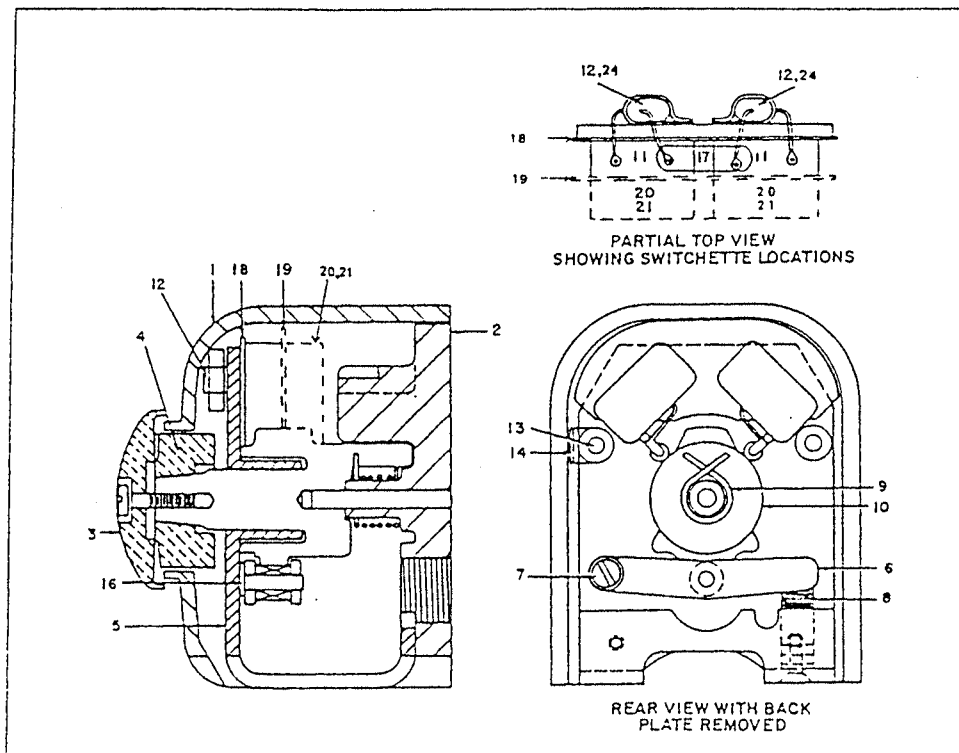


FIGURE 3

FORWARD / REVERSE SWITCH  
EV-1 SCR CONTROL  
REFER TO FIGURE 3

FIG. I.D.	T-D PART NO.	DESCRIPTION	QTY.
3-0	71-091-00	FORWARD/REVERSE SWITCH	1
3-1	71-091-51	COVER	1
3-2	71-091-52	BACK PLATE	1
3-3	71-091-53	HANDLE AND HUB	1
3-4	71-091-54	STOP	1
3-6	71-091-56	CAM FOLLOWER	1
3-7	71-091-57	SPACER	1
3-8	71-091-58	SPRING FOR CAM FOLLOWER	1
3-10	71-091-59	STAR WHEEL CAM	1
3-11	71-091-60	SWITCH, FORWARD & REVERSE	2
3-12	71-091-61	CAPACITOR ASSEMBLY	2
3-13	71-091-62	SPACER	2
3-14	71-091-63	WIRE CLIP	1
3-16	71-091-65	WASHER	1
3-17	71-091-66	JUMPER	1
3-18	71-091-67	INSULATION	1
3-19	71-091-68	INSULATION (OPTIONAL)	1
3-20	71-091-60	SWITCH (OPTIONAL), FOR SPECIAL ORDER ACCESS.	1
3-21	71-091-70	SWITCH (OPTIONAL), FOR SPECIAL ORDER ACCESS.	1
NOT SHOWN	71-091-71	STEERING COLUMN MOUNTING CLAMP	1
3-24	71-091-72	CAPACITOR CLAMP	2

NOTE: Standard hardware items listed below are not normally stocked by Taylor-Dunn but can be purchased locally.

SCREWS

10-32, 5/8" FLAT HEAD	4-40, 1/4" PAN HEAD
4-40, 3/4" PAN HEAD	4-40, 1-1/4" PAN HEAD
4-40, 1-3/4" PAN HEAD	6-32, 3/4" PAN HEAD
8-32, 3/4" PAN HEAD	8/32, 7/8" PAN HEAD
10-32, 1/2" PAN HEAD	10-32, 2-1/2" PAN HEAD

LOCK WASHERS

PLAIN WASHERS

NUTS

FOR #4 SCREW  
FOR #8 SCREW

FOR #4 SCREW  
FOR #8 SCREW

4-40 HEX  
10-32 HEX

ACCELERATOR SWITCH, GE SUPPLEMENT, FIGURE 4, PARTS LIST



## INSTRUCTIONS

GEH-4470A

# EV-1\* SCR CONTROL ACCELERATOR SWITCH IC4485ACC1

*Before any adjustments, servicing, parts replacement or any other act is performed requiring physical contact with the electrical working components or wiring of this equipment, JACK WHEELS OFF FLOOR, DISCONNECT THE BATTERY AND DISCHARGE CAPACITOR(S).*

## DESCRIPTION

The IC4485ACC1 is a family of accelerator master switches that may be either foot-operated through a pedal and linkage system or hand-operated by a suitable handle arrangement. This master switch offers a wide variety of options so that it may be customized to fit the user requirements. The master switch contains a switchette which closes at the beginning of travel to energize the control circuit, a switchette at the end of travel to bypass the control for maximum speed and torque, and a unique unidirectional potentiometer to vary the speed in between. The potentiometer is controlled by mechanical linkage to turn in only one direction so that it is independent of handle movement. This feature simplifies the setting of the potentiometer to provide consistent performance in both directions.

A single molded cam is used for the foot-operated CW and CCW forms. Direction of rotation can be changed in the field by changing the position of the start switchette and relocating the OFF-position stop.

A different molded cam is used for the hand-operated forms.

## INSTALLATION

A conduit plate can be located on either side. The four mounting holes are symmetrical relative to the shaft; only three need be used.

When an external linkage is used, a separate external return spring is required. Any external linkage that can be operated forcibly should also have an external mechanical stop.

\* Trademark of General Electric Company

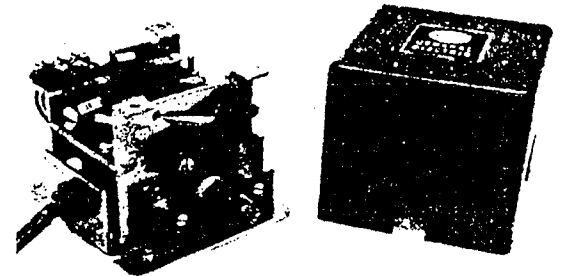


Fig. 1. IC4485ACC1 master switch with cover removed

TABLE 1  
CURRENT RATING OF SWITCHETTES

Voltage Inductive	Current-Amperes	
	Make and Break	Carry
6	10.0	10
12	6.0	10
18	4.0	10
24	3.5	10
30	3.0	10
36	2.5	10
48	2.0	10
72	1.0	10

The ratings in Table 1 are for single circuits (i.e., normally open contact only). Voltages above 72 require capacitor-type filters, in accordance with factory recommendations.

## MAINTENANCE

Oil-less bearings are used on both ends of the main operating shaft and thus eliminate the need for any lubrication of the switch.

## GEH-4470, EV-1\* Accelerator Switch

### SWITCHETTE ADJUSTMENT

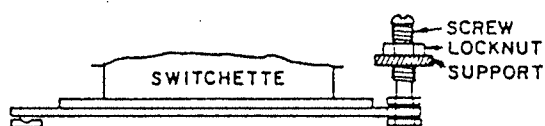


Fig. 2. Switchette adjustment, view from shaft end

Unlock locknut (see Fig. 2) and turn screw CW to make the normally open switchette close at less travel. The start switch should close at 5 to 8 degrees and reset at a minimum of 1-degree travel from the OFF position. The 1A switch should close at 26 to 29 degrees and reset at a minimum of 22 degrees travel from the OFF position. Total travel is 30 degrees.

### POTENTIOMETER ADJUSTMENT

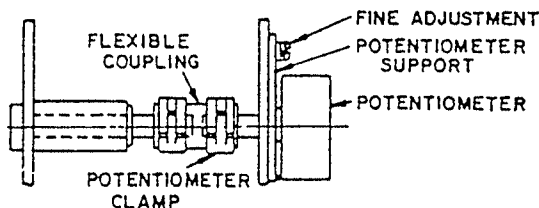


Fig. 3. Potentiometer and clamps

To remove the potentiometer, remove the wires from the terminal board, loosen the clamps on the flexible coupling with duck-bill pliers, and move both clamps to the left (see Fig. 3). Remove the potentiometer and its support by removing the two "fine-adjustment" screws. Retain the potentiometer support.

To replace, mount the new potentiometer on the support, locating the tab in the hole of the support, and secure with the lockwasher and nut. With an ohmmeter on the potentiometer terminals (R x 100 scale), turn the shaft clockwise until the point where the resistance starts to reduce below the level (4800- to 6000-ohm) portion of the curve (see Fig. 4). This corresponds to the START position.

6000-4800 OHMS

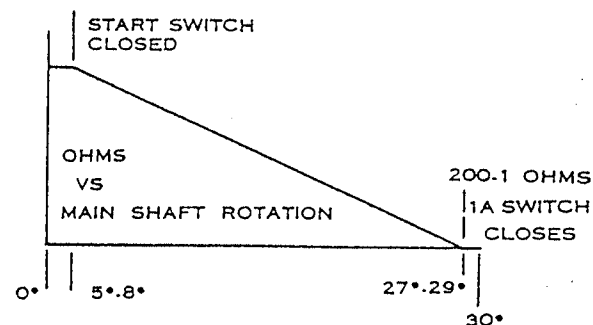


Fig. 4. Potentiometer resistance curve

With the potentiometer clamp moved to the left and the master switch in the START position, line up the potentiometer shaft with the flexible coupling and center the fine-adjustment slots with the fine-adjustment tapped holes. Push the potentiometer until the support is against the frame. Assemble, but do not tighten, the fine-adjustment screws. Release the coupling clamp with duck-bill pliers and slide the clamp into position.

Rotate the master switch shaft until the START switchette operates (a slight click at about 7 degrees). The ohmmeter should be 4800 to 6000 ohms. Continue rotating the shaft until the 1A switchette operates (a slight click at about 28 degrees). The ohmmeter should be less than 200 ohms and remain above 1 ohm, when the shaft is rotated fully.

If the ohms are too low when the start switch closes, loosen the fine-adjustment screws and rotate the potentiometer support CCW.

If the ohms are too high when the 1A switch closes, loosen the fine-adjustment screws and rotate the potentiometer support CW.

If the fine adjustment is not enough to bring the resistance values within limits, return the master switch to the OFF position, release the potentiometer clamp with duck-bill pliers, and turn the potentiometer shaft with needle-nose pliers a slight amount. (Clockwise from shaft end of potentiometer to reduce ohms.) Recheck resistances at START and 1A and use fine adjustment as described previously if necessary.

Check that coupling clamps are in position and the fine-adjustment screws are tight.

\* Trademark of General Electric Company



EV-1\* Accelerator Switch, GEH-4470

**FIELD MODIFICATION OF  
FOOT-OPERATED SWITCH**

If the direction of rotation of a foot-operated switch needs to be changed, the location of the OFF-position stop, the switchette and the cam must be changed. (See Figs. 5 and 6 and Table 2.)

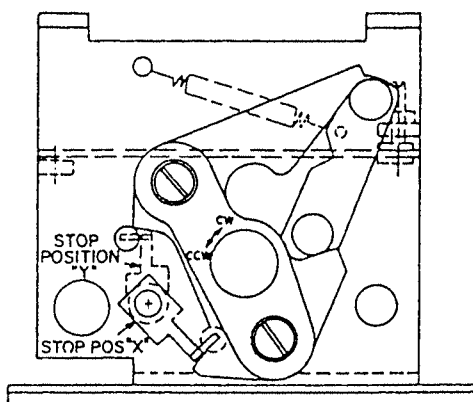


Fig. 5. OFF-position stop

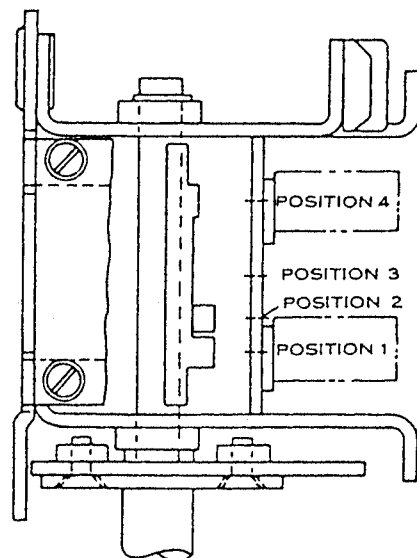


Fig. 6. Switchette position

TABLE 2

OFF-POSITION STOP AND SWITCHETTE POSITION

Switch Rotation	Switchette Position (See Fig. 6)		Stop Position (See Fig. 5)	Use Cam
	Start	1A		
CW	2	4	Y	194B8333P1
CCW	3	4	X	171B3172P1
CW and CCW	1 and 3	4	Stop not used	171B3172P1

\* Trademark of General Electric Company

ACCELERATOR SWITCH EV-1 SCR  
REFER TO FIGURE 4

FIG. I.D.	T-D PART NO.	DESCRIPTION	QTY.
4-0	61-912-00	ACCELERATOR SWITCH COMPLETE	1
4-1	61-912-51	SWITCH ASSEMBLY	2
4-5	61-912-55	SCREW, ADJUSTING FOR SWITCH	2
4-5A	88-049-80	NUT, HEX 10-32	2
4-6	61-912-57	STOP	1
4-7	61-912-58	CAM	1
4-8	61-912-59	CAM SHIFT ASSEMBLY	1
4-9	61-912-60	POTENTIOMETER OPERATING ARM & SHAFT	1
4-10	61-912-61	SPRING, RETURN	1
4-11	61-912-62	TERMINAL BOARD	1
4-12	61-912-63	SWITCH SUPPORT BASE	1
4-13	61-912-64	POTENTIOMETER 5K, WITH MOUNTING BRACKET	1
NOT SHOWN	61-912-65	WIRING HARNESS COMPLETE WITH 12 POINT PLUG	1
NOT SHOWN	61-912-66	HOSE	1
NOT SHOWN	61-912-67	CLAMPS, HOSE	2
NOT SHOWN	61-912-68	COVER	1
NOT SHOWN	61-912-69	PLATE, COVER	1
NOT SHOWN	61-912-70	PLUG, RUBBER (FITS IN COVER PLATE)	1
4-19	61-912-71	SHAFT ASSEMBLY	1
<u>NOTE:</u>		The standard hardware items listed below are not normally stocked by Taylor-Dunn but can be purchased locally.	

SCREW WITH SPRING LOCK WASHER

SCREWS

6-32, 1/2" PAN HEAD  
8-32, 3/8" PAN HEAD  
8-32, 1/2" PAN HEAD

6-32, 3/8" FLAT HEAD  
10-32, 1/2" FLAT HEAD

PLAIN WASHERS

RETAINING RINGS

FLAT HEAD LOCK WASHER

#6 SCREW  
#8 SCREW  
#10 SCREW

EXTERNAL "E" RING FOR 1/4" DIA. SHAFT  
EXTERNAL "E" RING FOR 3/8" DIA. SHAFT

10-32 SCREW

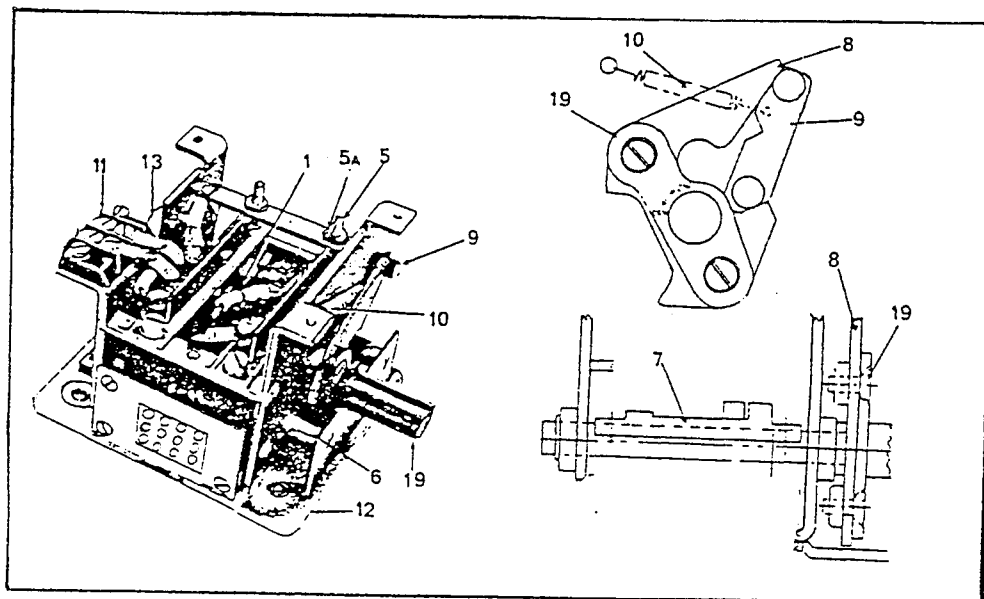


FIGURE 4

CONTACTORS PANELS - 75 AMP



# INSTRUCTIONS

GEH-3099A

## 75-AMPERE ELECTRIC-VEHICLE CONTROL CONTACTORS

IC2800-M601, -M610, -M611

*Before any adjustments, servicing, parts replacement or any other act is performed requiring physical contact with the electrical working components or wiring of this equipment, the POWER SUPPLY MUST BE DISCONNECTED.*

### GENERAL

These d-c contactors are designed for 36-volt maximum, intermittent-duty operation, such as found in battery-powered lift trucks and golf-cart services. The shunt-operating coils are rated for 50-percent time-on intermittent duty. The contactors are self-contained units suitable for mounting on the vertical surfaces of either metal or insulated bases. All terminals and mounting holes are accessible from the front of the device.

TABLE I  
IDENTIFICATION

Nomenclature IC2800	Power Circuits
-M601	1-NC
-M610	1-NO
-M611	1-NO - 1-NC (DPDT)

TABLE II  
CURRENT RATINGS OF POWER CONTACTS

Amperes	Duty Cycle Percent Time-on	Maximum Time-on
50	100*	Continuous*
75	50	5 Minutes
250	5	30 Seconds
500†	2	5 Seconds

\* For continuous applications, the operating coil must be de-rated or a holding resistor must be inserted in series with the operating coil.

† The maximum interrupting rating of these contactors is 300 amperes at 36 volts with an inductive load such as a motor.

### ARCING CLEARANCES

During installation, it is important that certain minimum clearance be maintained between the contactor and other surrounding components. See Fig. 3.

### CONNECTIONS

As a rule, the normally open power connections and the coil terminal connections are at the top of the contactor, with the normally closed power connections at the bottom. (See Figs. 1 and 2). Certain special forms have other configurations. A quick visual check can be made as shown in Fig. 2.

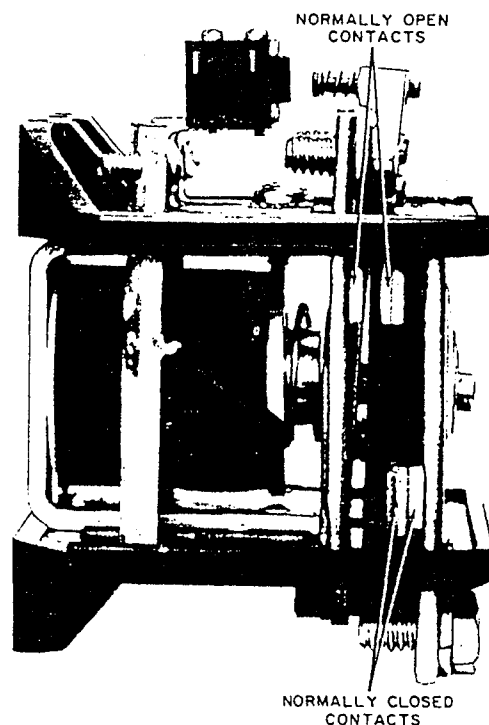


Fig. 1. IC2800-M611 contactor for electric-vehicle applications.

Forms of the IC2800-M611 (DPDT) are available with a tie between one of the normally open stationary contacts and one of the normally closed

## GEH-3099A, 75-ampere Electric-vehicle Control Contactors

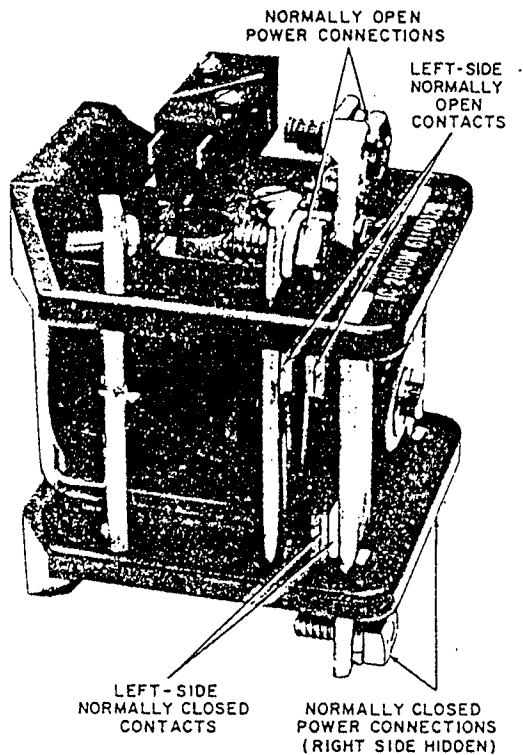


Fig. 2. IC2800-M611 contactor with CR1070C143C3 interlock.

stationary contacts. This tie or common connection is available either on the left or the right side of the contactor. A typical application of these contactors is as a reversing pair.

The power connections are 1/4 - 20 screws, which should be tightened to 45 to 60 inch-pounds (5.1 to 6.8 newton meters [N·m]). It is recommended that this tightening be done with a screw driver, spin tight, or a socket on a shaft extension. If a wrench is used, take care that the head or body of the wrench does not come in contact with the molded side plate (see Fig. 4). That is, do not use the molded side plate as a pivot point.

### VOLTAGE SPIKE SUPPRESSION

When these contactors are used in conjunction with static control, it is often necessary to suppress the voltage spike which results when coil current is interrupted. This is done to prevent damage to static components such as silicon controlled rectifiers, transistors, etc.

Use only those voltage spike suppressors which are factory specified and supplied by the truck manufacturer.

When connecting the suppressors across the coil, polarity must be maintained in accordance with Fig. 5.

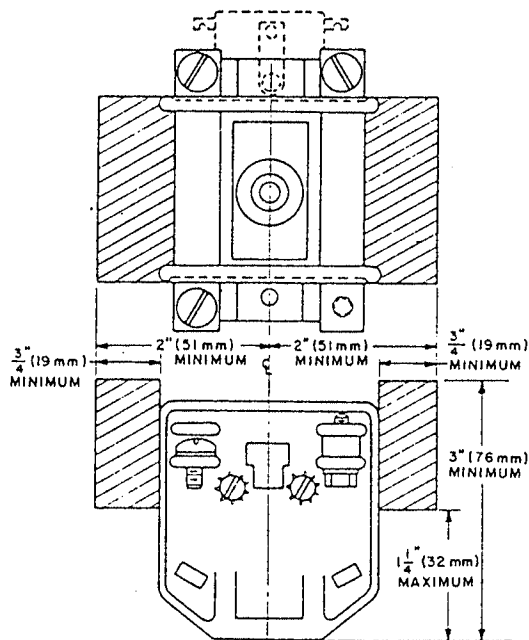


Fig. 3. Installation clearances. For proper operation the shaded area should be free of any obstructions.

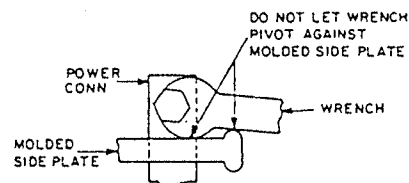


Fig. 4. Proper use of a wrench when tightening power contacts.

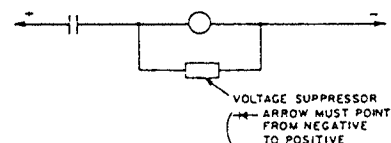


Fig. 5. Polarity maintenance.

### MAINTENANCE AND ADJUSTMENTS

The following information is intended to assist during periods of normal maintenance and to provide checks to determine if the contactors are in proper operating condition.

As these devices are adjusted, inspected, and tested at the factory, they should not normally require further adjustments. However, any time a part has been replaced, the following checks should be made.

## 75-ampere Electric-vehicle Control Contactors, GEH-3099A

### POWER CONTACTS

In normal operation, the contacts will become blackened, discolored, and roughened. This will not interfere with proper operation and cleaning is not necessary. The contacts should be replaced before the silver-alloy contact facing is completely eroded through to the backing material, or before the wipe is reduced to zero. The silver alloy may transfer from one contact and cause buildup on the mating contact. This can be expected under certain conditions and does not require contact dressing or filing. When replacing only one contact of a mating pair, remove any high peaks or beads of material on the contact that is not replaced.

### POWER CONTACTS ADJUSTMENTS

With the contactor mounted or held in its normal operating position (see Fig. 3), check the contact wipes and gaps. These checks are most easily made with small rods or drills of a diameter equal to the dimensions given below. These contactors are double break (two sets of contacts per circuit) and the gaps must be measured on both sets of contacts.

Normally open gap - 0.050 inches (1.27 mm)  
minimum each side

Normally closed gap - 0.050 inches (1.27 mm)  
minimum each side

Normally open wipe - 0.040 inches (1.0 mm)  
minimum

Normally closed wipe - no check

**NOTE:** The normally open wipe measurement given is with new contacts and will decrease as the contacts wear.

Figures 6 and 7 show de-energized and energized positions, and where to measure.

The only means of adjusting to obtain these measurements is by moving the side plates in or out on the frame. If adjustment is necessary, make sure that the side plates are relatively square with respect to each other and with the U-frame. Re-check the electrical interlock adjustments and, if necessary, re-adjust per the section on Electrical Interlocks in this instruction publication.

### REPLACEMENT OF PARTS

It is necessary to disassemble these devices in order to replace any part except the electrical interlock or its operator. For this reason, you may

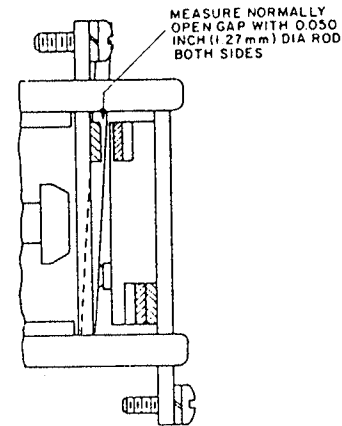


Fig. 6. Contactor in de-energized position.

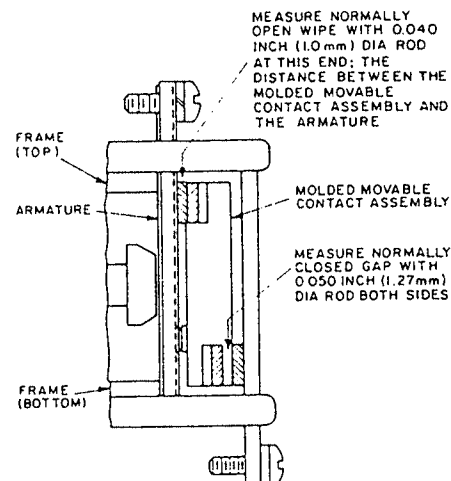


Fig. 7. Contactor in energized position with armature firmly seated against the frame at top and bottom.

find it to your advantage to replace the entire contactor whenever a complete set of contacts or a new coil is needed. However, if you desire to replace a part, use the following procedures:

1. Disconnect the contactor and remove it from the vehicle.
2. To replace the coil, first unsolder the coil leads from the coil terminal strips; then remove the screws which fasten the molded side plates to the frame.
3. Now, slide the frame and coil out from between the molded side plates. If the core does not have a head, it is now possible to remove the coil without disassembling the core and the frame. If

## GEH-3099A, 75-ampere Electric-vehicle Control Contactors

the core does have a head, you must remove the screw which holds the core to the frame. It may be necessary to hold the core with a pair of pliers.

4. Replace the coil, and reassemble the core to the frame. Be sure the special conical lockwasher is in place and that the screw is tightened.

5. Slide the frame and coil assembly back between the molded side plates with the armature spring positioned as shown in Fig. 8.

6. Replace the screws in the side plates, making sure the stationary contacts and the coil terminal strips are positioned in their respective slots in the side plates.

7. Check the power contact gaps and wipes per the Power Contact Adjustments section of this instruction publication. Also, check the electrical interlock and, if necessary, readjust per the section on Electrical Interlock Adjustments in this instruction publication. Make sure the armature spring is properly seated as shown in Fig. 8.

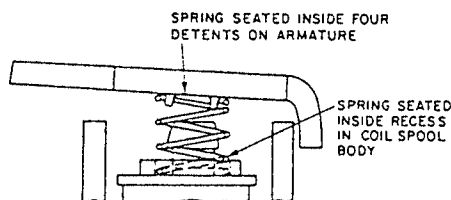


Fig. 8. Outline drawing of armature spring.

8. The side plates can be moved by the amount the holes are larger than the screws. Try to align the side plates as squarely as possible with the frame.

9. To replace a worn contact or set of contacts, first disconnect the contactor and remove it from the vehicle.

a. Remove the bottom molded side plate. Note that by leaving the top molded side plate attached to the frame, the normally open contact adjustments and the electrical interlock adjustments will not be changed.

b. Replace the worn contacts and reassemble the contactor, taking care that the stationary contact strips, the coil terminal strips, and the armature tongues are all properly positioned in their respective slots in the side plates. Make sure the armature spring is positioned as shown in Fig. 8.

c. Check the contact gaps and wipes and the electrical interlock adjustments and if necessary, re-adjust per the applicable sections in this instruction publication.

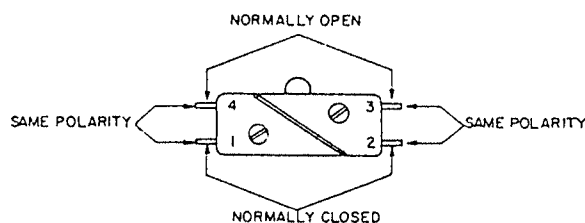


Fig. 9. CR1070C143C3 interlock connections.

### ELECTRICAL INTERLOCKS

An auxiliary snap-action electrical interlock can be mounted on most forms of these contactors (see Fig. 1). This electrical interlock has one normally open pole and one normally closed pole. It must be adjusted to operate in the following manner.

1. With a 0.010-inch (0.25 mm) thick shim or rod between the armature and the U-frame at the top, the interlock must operate when the coil is energized or when the armature is manually operated.

2. With an 0.030-inch (0.76 mm) thick shim or rod, using the same procedure, the interlock should not operate. The interlock mounting bracket has slotted mounting holes and can be moved in or out to obtain these requirements. If it is necessary to do this, recheck the contact adjustments per this instruction publication.

TABLE III  
INTERLOCK RATINGS (RECOMMENDED)

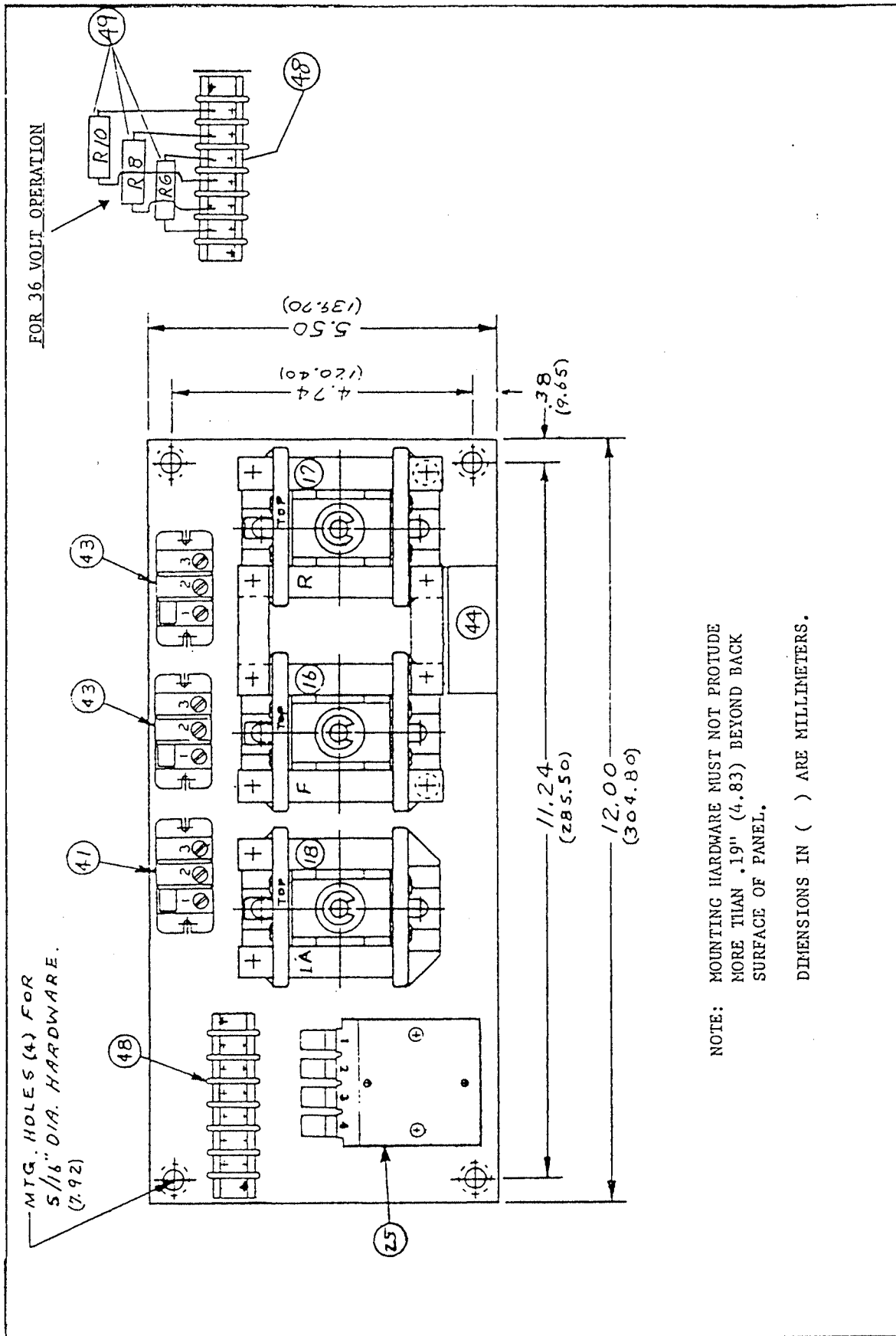
Voltage Inductive	Current-Amperes	
	Make and Break	Carry
6	10.0	10
12	6.0	10
18	4.0	10
24	3.5	10
30	3.0	10
36	2.5	10

Ordinarily, any one circuit will control two of the coils used in these contactors. Coils may be connected either in series or parallel.

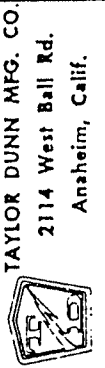
### RENEWAL PARTS

When ordering renewal parts, address the nearest General Electric Company sales office, specify the quantity required, and give the catalog number or describe the required parts in detail. Give the complete nameplate rating of the equipment.

INDUSTRIAL CONTROL DEPARTMENT, GENERAL ELECTRIC COMPANY, U.S.A.



NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
1	TOOL. FRAC. + DEC. +				
2	SCALE				
3	DRAWN BY				
4	DATE				



EV-1 SCR 75 AMP-24/36VOLT CONTACTOR PANEL

FIGURE 5

TAYLOR DUNN MFG. CO.

2114 West Ball Rd.

Anaheim, Calif.

EV-1 SCR 75 AMP CONTACTOR PANEL  
REFER TO FIGURE 5

FIG. I.D.	T-D PART NO.	DESCRIPTION	QTY.
5-0	71-306-00	CONTACTOR PANEL ASSEMBLY (75 AMP/24 VOLT COIL)	1
5-16	71-306-51	CONTACTOR, FWD., SINGLE POLE, DOUBLE THROW	1
5-17	71-306-52	CONTACTOR, REV., SINGLE POLE, DOUBLE THROW	1
5-18	71-306-52	CONTACTOR, 1A BY-PASS, SINGLE POLE, SINGLE THROW	1
5-25	71-305-54	CONTACTOR DRIVER	2
5-25	79-731-00	HOUR METER DIODE BLOCK (OPTIONAL)	1
5-41	71-306-53	FILTER BLOCK, 1A	1
5-43	71-306-54	FILTER BLOCK, FORWARD/REVERSE	2
5-44	71-305-55	NAME PLATE (SPECIAL ORDER ITEM)	1
5-48	79-864-00	TERMINAL BOARD (6 POSITION)	2
5-49	78-306-55	RESISTOR (FOR 36 VOLT USE)	3

\*\*\* MOUNTING HARDWARE OBTAINED THROUGH LOCAL PURCHASE



150- AND 300- AMPERE ELECTRIC VEHICLE CONTROL CONTACTORS



## INSTRUCTIONS

GEH-4469

### 150- AND 300-AMPERE ELECTRIC-VEHICLE CONTROL CONTACTORS

IC4482-CTR A700, A800 SERIES

*Before any adjustments, servicing, parts replacement or any other act is performed requiring physical contact with the electrical working components or wiring of this equipment, DISCONNECT THE BATTERY, DISCHARGE CAPACITOR(S), AND JACK WHEELS OFF FLOOR.*

#### DESCRIPTION

##### GENERAL

These d-c contactors are designed for low-voltage, intermittent-duty operation such as found in battery truck service.

##### PURPOSE OF INSTRUCTIONS

The purpose of these instructions is to instruct the user on proper care and maintenance to obtain satisfactory service from these devices. The manufacturer of the electric vehicle has tested and applied these contactors according to the requirements of his vehicle. No modifications or changes should be made in the layout, physical arrangement or electrical connections without his permission.

##### MOUNTING

These contactors are designed to mount on a vertical surface or on a horizontal surface.

##### DISASSEMBLY AND ASSEMBLY

Two main categories of these contactors are available. The single-pole normally open types, and the single-pole double-throw types which have one normally open and one normally closed contact (Fig. 1). The assembly and disassembly of these devices will be covered individually.

**Single-pole, Double-throw Type**  
(One Normally Open and One Normally Closed Contact)

##### DISASSEMBLY

(Refer to Fig. 2, page 2 for exploded view and parts index).

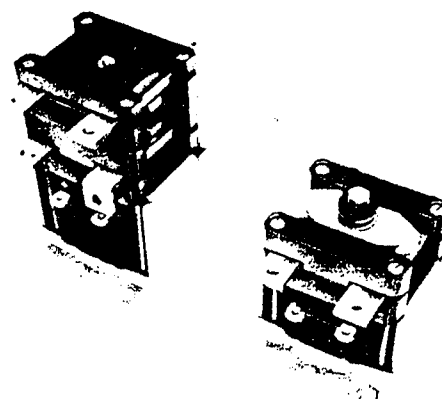


Fig. 1. Right - Single-pole, single-throw type  
(one normally open contact)  
Left - Single-pole, double-throw type  
(one normally open and one normally closed contact)

1. Remove all electrical connections and remove the contactor from the vehicle for easier servicing.
2. Loosen the four long bolts in each corner, remove the top contact retainer, and the long bolts.
3. Remove the two top stationary normally closed contacts.
4. Remove the two contact spacers.
5. Remove the two bottom stationary contacts.
6. Remove armature and movable-contact assembly.
7. Remove magnet frame and coil from base.
8. Loosen and remove the 10-32 nut from the armature and movable-contact assembly using a 3/8-inch socket or nut driver. Note the order in which the parts are removed from the stud.

*The information contained herein is intended to assist truck users and dealers in the servicing of control furnished by the General Electric Company. It does not purport to cover all details or variations in equipment or provide for every possible contingency to be met in connection with installation, operation or maintenance.*

*Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the truck manufacturer through his normal service channels, not directly to General Electric Company.*

**GEH-4469, 150- and 300-Ampere Electric-vehicle Control Contactors**

PARTS INDEX

1. Long bolt with #8 lock washer
2. Top contact retainer
3. Top stationary contact
4. Contact spacer
5. Bottom stationary contact
6. Armature and movable-contact assembly
  - a. 10-32 nut
  - b. No. 10 lock washer
  - c. No. 10 flat washer
  - d. Movable-contact carrier
  - e. Shim
  - f. Movable contact
  - g. Spring cup (snaps into 6f)
  - h. Contact spring
  - i. Bottom stationary-contact support
  - j. Armature
  - k. Spiral return spring
7. Magnet frame
8. Coil
9. Base
10. Bus connector

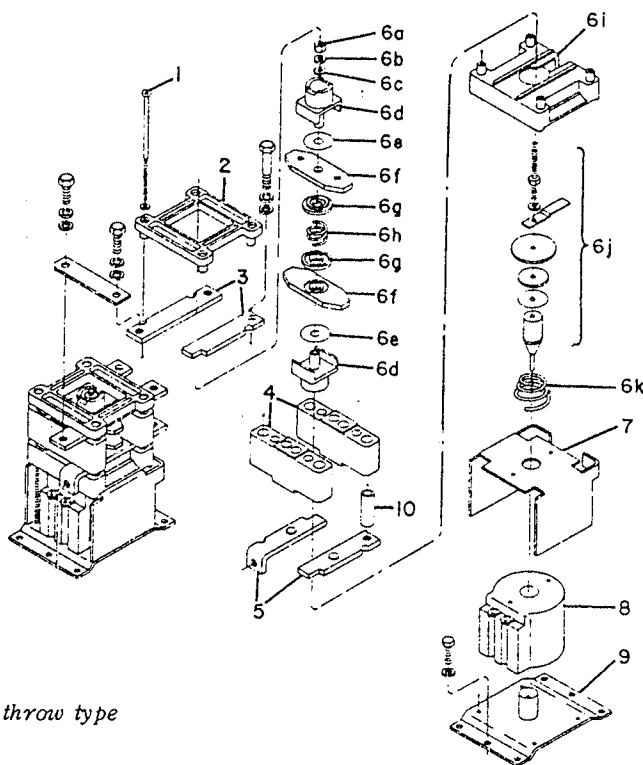


Fig. 2. Assembly of single-pole, double-throw type

PARTS INDEX

1. Long bolt with #8 lock washer
2. Contact spacer
3. Stationary contacts
4. Armature and movable-contact assembly
  - a. 10-32 nut
  - b. No. 10 lock washer
  - c. No. 10 flat washer
  - d. Contact spring retainer
  - e. Contact spring
  - f. Movable contact
  - g. Shim
  - h. Movable-contact carrier
  - i. Stationary-contact support
  - j. Armature
  - k. Spiral return spring
5. Magnet frame
6. Coil
7. Base

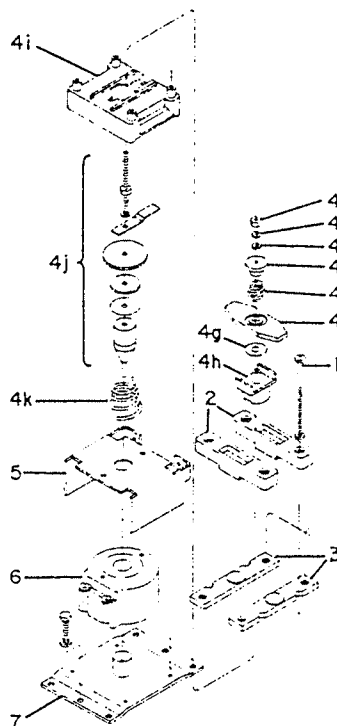


Fig. 3. Assembly of single-pole, single-throw type

#### ASSEMBLY

(Refer to Fig. 2, page 2 for exploded view and parts index).

Before assembly, all parts should be cleaned, inspected for wear and replaced if required. Assembly is performed in reverse order from disassembly with the following precautions required:

1. Force the small end of the spiral spring over the small diameter on the armature assembly. See Fig. 4, page 3.
2. Reassemble the armature parts 6a to 6k and tighten the 10-32 nut to 14 to 18 inch-pounds torque (1.6 to 2.0 Newton meters).
3. Locate the projections on the magnet frame in the indentations on top of the coil with frame oriented as in Fig. 2.
4. Add the armature and moveable-contact assembly.
5. Properly seat the stationary contacts in the slots of the molded stationary contact support and add the two contact spacers.
6. Add the two top stationary contacts and top contact retainer. Insert bus connector before proceeding to Step 7.
7. Tighten the four long bolts in a uniform manner using a diagonal tightening sequence. Tighten the bolts with 14 to 18 inch-pounds torque (1.6 to 2.0 Newton meters).

#### DISASSEMBLY AND ASSEMBLY

Single-pole, Single-throw Type  
(One Normally Open Contact)

#### DISASSEMBLY

(Refer to Fig. 3, page 2 for exploded view and parts index).

1. Remove all electrical connections and remove the contactor from the vehicle for easier servicing.
2. Loosen the four long bolts in each corner and remove the two contact spacers.
3. Remove the two stationary contacts.
4. Remove armature and movable-contact assembly.
5. Remove magnet frame and coil from the base.

6. Loosen and remove the 10-32 nut from the armature and movable contact assembly using a 3/8-inch socket or nut driver. Note the order in which the parts are removed from the stud. See Fig. 3, page 2.

#### ASSEMBLY

(Refer to Fig. 3, page 2 for exploded view and parts index).

Before assembly all parts should be cleaned and inspected for wear and replaced if required. The assembly is performed in the reverse order from the disassembly with the following precautions required:

1. Force the small end of the spiral spring over the small diameter on the armature assembly. See Fig. 4, page 3.
2. Reassemble the armature parts 4a to 4k and tighten the 10-32 nut to 14 to 18 inch-pounds torque (1.6 to 2.0 Newton meters).
3. Locate the projections on the magnet frame in the indentations on top of the coil with frame oriented as in Fig. 3.
4. Add the armature and moveable-contact assembly.
5. Properly seat the stationary contacts in the slots of the molded stationary-contact support and add the two contact spacers.
6. Tighten the four long bolts with 14 to 18 inch-pounds torque (1.6 to 2.0 Newton meters).

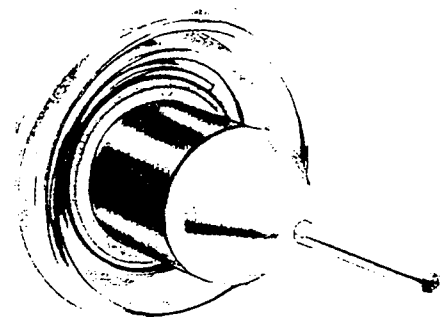


Fig. 4. Spiral spring attached to small diameter on cone head

# 150- and 300-Ampere Electric-vehicle Control Contactors, GEH-4469

## AUXILIARY CONTACTS

Auxiliary contacts or electrical interlocks are available for the contactors as shown mounted on the contactor in Fig. 5. The auxiliary contact block is operated by de-energizing the contactor. Figures 6 and 7, page 4, illustrate the operations.

To obtain proper operation of the contact block, the gap between the auxiliary contact operator and the button on the contact block should be as shown in Fig. 7. This gap can be obtained by loosening the adjustment screws and moving the interlock support. The slots in the support permit this adjustment. The screws should be retightened to 14 to 18 inch-pounds torque (1.6 to 2.0 Newton meters).

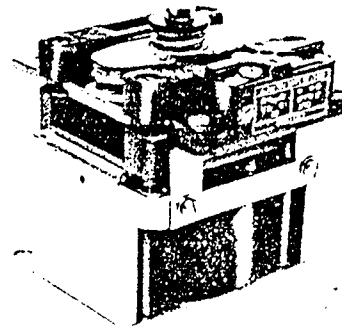


Fig. 5. Contactor with an auxiliary contact

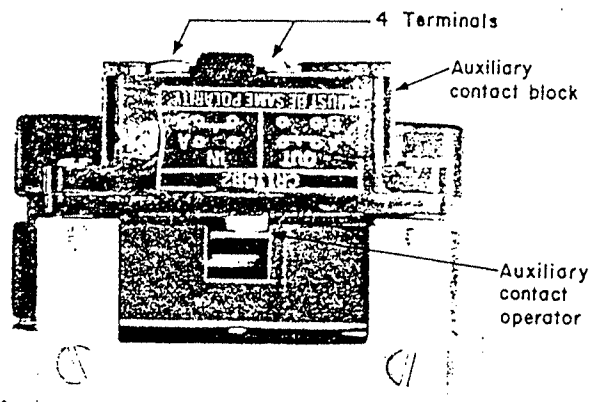


Fig. 6. Auxiliary contact shown in the operated position by the de-energized contactor

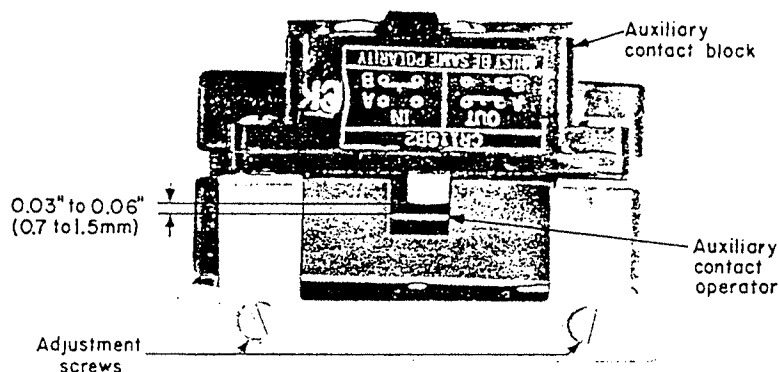


Fig. 7. Auxiliary contact shown in the normal position by the energized contactor

## GEH-4469, 150- and 300-Ampere Electric-vehicle Control Contactors

### Maintenance And Inspection Of Parts

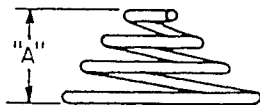
#### CONTACTS

Contacts must be replaced before they have worn through contact button to the base copper material.

#### SPIRAL RETURN SPRING

The free length should be between the limits shown in the table and should be replaced if it shows signs of corrosion.

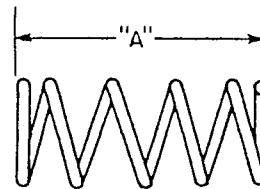
Contactors	Free Length "A" In inches (mm)
700, 710	0.73 to 0.79 (18.5 to 20.1)
701, 711, 712, 801, } 702, 802, } 811, 812 }	0.67 to 0.73 (17.3 to 18.5)
800, 810	0.80 to 1.00 (20.3 to 25.5)



#### CONTACT SPRING

The free length should be between the limits shown in the table and should be replaced if it shows signs of having been overheated or of corrosion.

Contactors	Free Length "A" In inches (mm)
700, 701, 711, 712, 801, 702, 802, 811, 812 }	0.38 to 0.40 (9.6 to 10)
800, 810	0.37 to 0.39 (9.4 to 9.9)



#### COILS

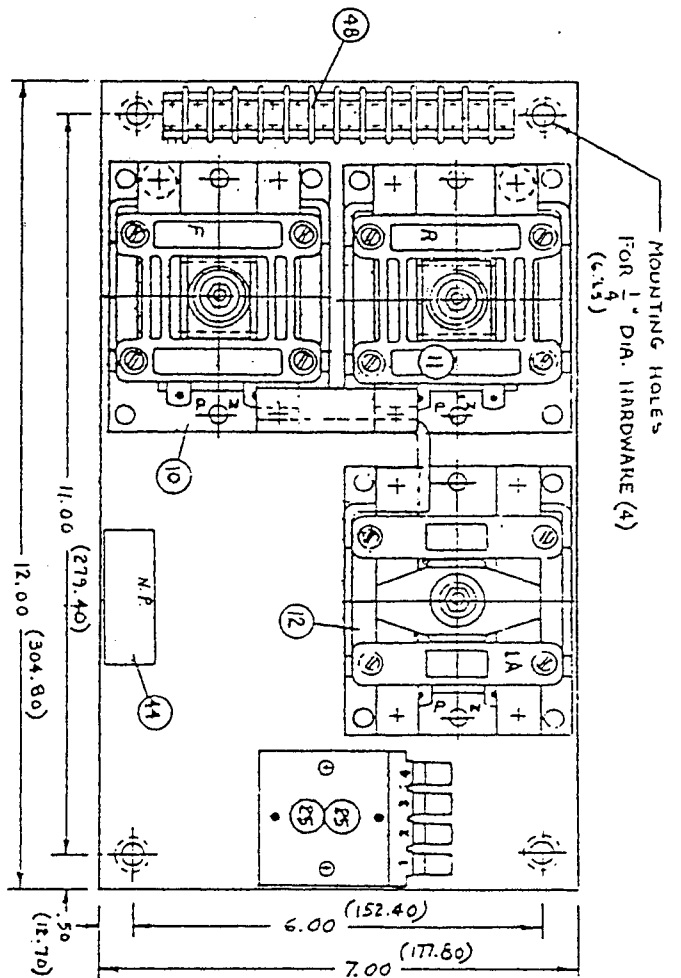
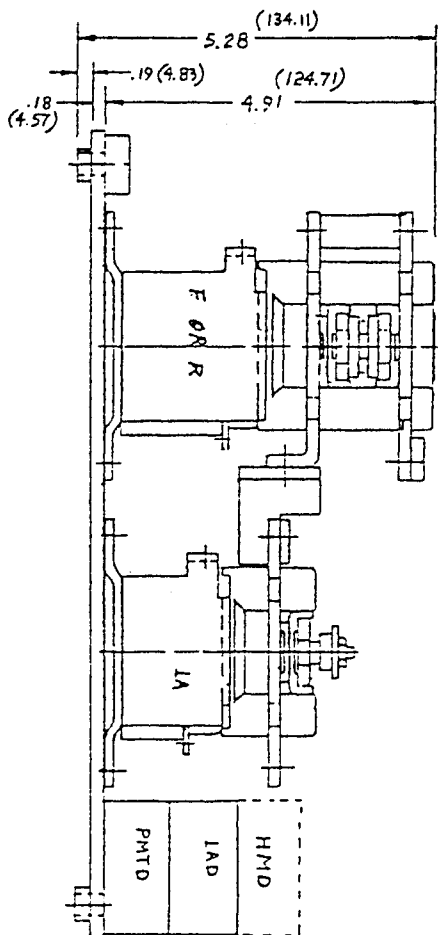
**CAUTION:** The coils have voltage suppression cast integral with the coil. If a test voltage is applied in the wrong direction or if the coil is connected backwards, permanent damage may result. Observe the polarity mark on the coil during maintenance.

If the contactor fails to operate, measure the voltage being applied to the coil terminals. The coils on the contactor have been designed to actuate the contactor on reduced battery voltage and with approximately three volts drop in the electronic circuit so that all contactors should operate at or below 65 percent of rated battery voltage. Replace the coil if the contactor does not operate to the full stroke on 65-percent voltage or if the coil shows signs of being overheated.

#### RENEWAL PARTS

Only factory specified parts should be used. These parts should be obtained from the truck manufacturer through his normal service channels.

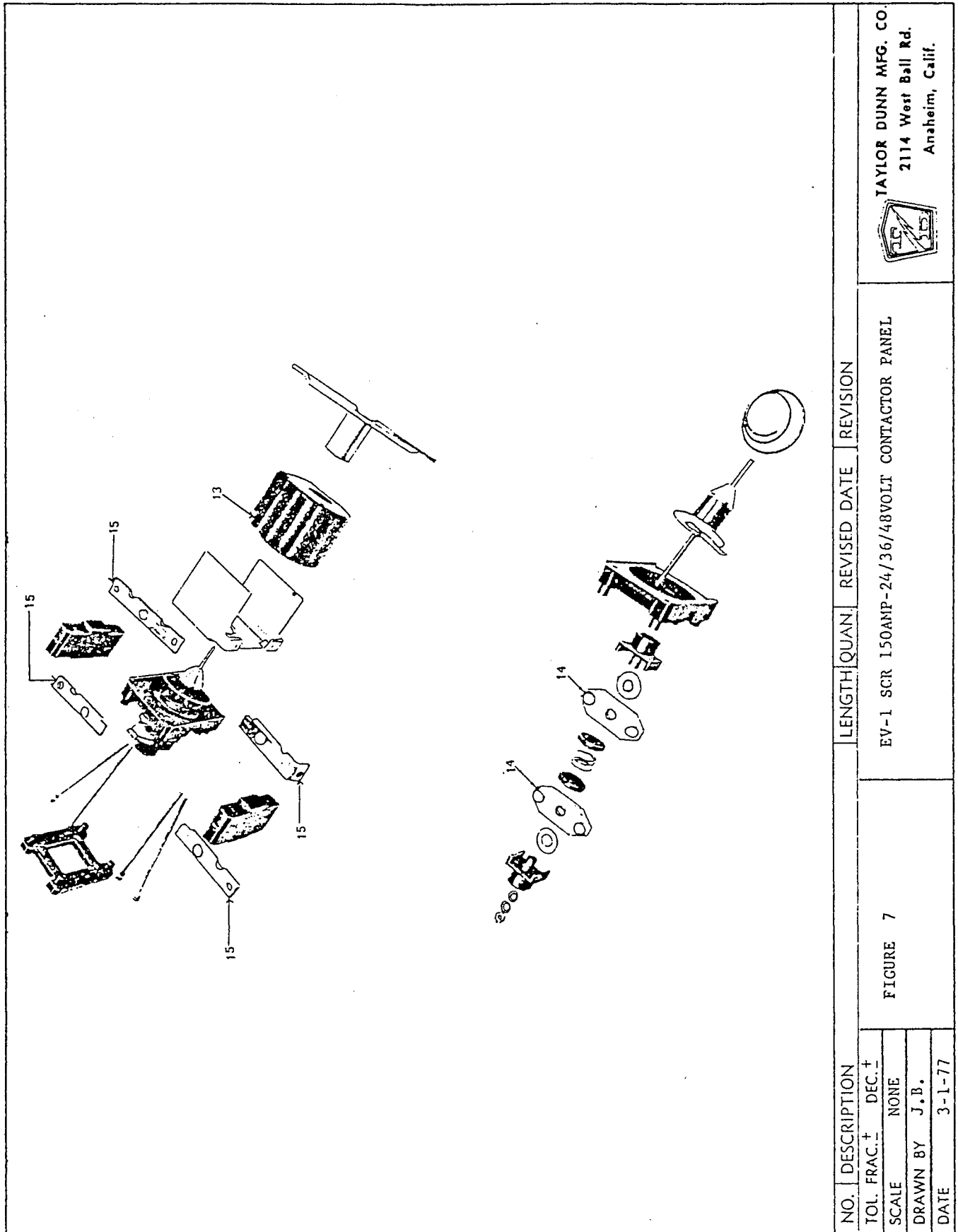
NO.	DESCRIPTION	LENGTH	QUAN.	REVISED DATE	REVISION
TOL. FRAC. $\pm$	DEC. $\pm$				
SCALE	NONE				
DRAWN BY	J.B.				
DATE	2-2-77				
FIGURE 6		EV-1 SCR 150 AMP-24/36/48VOLT CONTACTOR PANEL			



NOTE:  
MOUNTING HARDWARE  
MUST NOT PROTRUDE  
MORE THAN .19" (4.83  
BEYOND BACK OF PANEL  
DIMENSIONS IN ( )  
ARE MILLIMETERS.



TAYLOR DUNN MFG. CO  
2114 West Ball Rd.  
Anaheim, Calif.



TAYLOR DUNN MFG. CO.  
2114 West Ball Rd.  
Anaheim, Calif.

EV-1 SCR 150AMP-24/36/48VOLT CONTACTOR PANEL

FIGURE 7

LENGTH QUAN. REVISED DATE REVISION

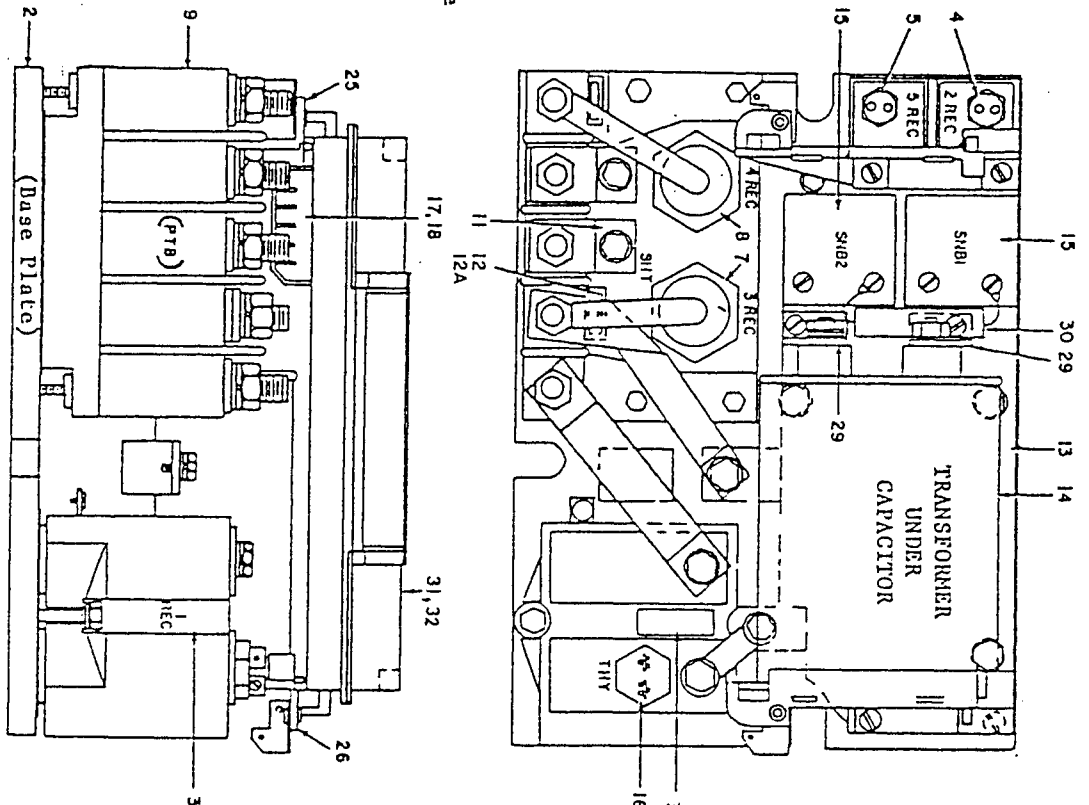
NO.	DESCRIPTION
TOL. FRAC.	DEC.
SCALE	NONE
DRAWN BY	J.D.
DATE	3-1-77

EV-1 SCR 150 CONTACTOR CONTROL  
REFER TO FIGURE 6

FIG. I.D.	T-D PART NO.	DESCRIPTION	QTY.
6-0	71-305-00	CONTACTOR PANEL ASSEMBLY	1
6-10	71-305-70	CONTACTOR, FWD., SINGLE POLE, DOUBLE THROW	1
6-11	71-305-80	CONTACTOR, REV., SINGLE POLE, DOUBLE THROW	1
6-12	71-305-90	CONTACTOR, 1A., SINGLE POLE, SINGLE THROW	1
6-25	71-305-54	CONTACTOR DRIVER	2
NOT SHOWN	79-731-00	HOUR METER DIODE BLOCK (OPTIONAL)	1
6-44	71-305-55	NAMEPLATE (SPECIAL ORDER ITEM)	1
6-48	71-305-56	TERMINAL BOARD, 12 POSITION	1
REFER TO FIGURE 7 FOR CONTACTOR PARTS			
FWD/REV CONTACTOR COMMON PARTS (EXCEPT AS NOTED):			
7-13	71-305-71	COIL, 36/48 VOLT, FWD/REV CONTACTORS	2
7-13	71-305-72	COIL, 24 VOLT, FWD/REV CONTACTORS (OPTIONAL)	2
7-14	71-305-73	MOVING TIP ASSEMBLY, FWD/REV CONTACTORS	2
NOT SHOWN	71-305-79	SPACER, FWD/REV CONTACTORS	2
NOT SHOWN	71-305-78	MOUNTING BOLT, SPACER, FWD/REV CONTACTORS	2
FORWARD CONTACTOR:			
7-15	71-305-74	TERMINAL, L.H. TOP, FWD CONTACTOR	1
7-15	71-305-75	TERMINAL, R.H. TOP, FWD CONTACTOR	1
7-15	71-305-76	TERMINAL, L.H. BOTTOM, FWD CONTACTOR	1
7-15	71-305-77	TERMINAL, R.H. BOTTOM, FWD CONTACTOR	1
REVERSE CONTACTOR:			
7-15	71-305-75	TERMINAL, L.H. TOP, REV CONTACTOR	1
7-15	71-305-81	TERMINAL, R.H. TOP, REV CONTACTOR	1
7-15	71-305-82	TERMINAL, L.H. BOTTOM, REV CONTACTOR	1
7-15	71-305-83	TERMINAL, R.H. BOTTOM, REV CONTACTOR	1
1A CONTACTOR:			
7-13	71-305-91	COIL, 36/48 VOLT, 1A CONTACTOR	1
7-13	71-305-92	COIL, 24 VOLT, 1A CONTACTOR (OPTIONAL)	1
7-15	71-305-93	TERMINAL, L.H., 1A CONTACTOR	1
8-15	71-305-94	TERMINAL, R.H., 1A CONTACTOR	1
8-14	71-305-95	MOVING TIP ASSEMBLY, FWD/REV CONTACTOR	1



NOTE: Apply a thin coating of heat conductive grease T-D Part #94-422-00 to the bottom of the Control Module (Base Plate) before mounting Module on vehicle.

[illegible]

**TAYLOR DUNN MFG. CO.**  
2114 West Ball Rd.  
Anaheim, Calif.

EV-1 CONTROL MODULES - A & B

REFER TO FIGURE 8

FIG. I.D.	T-D PART NO.	DESCRIPTION	QTY. REQ.	
			A	B
	62-002-00	EV-1 SCR CONTROL MODULE - A	1	
	62-011-00	EV-1 SCR CONTROL MODULE - B		1
8-3	62-002-53	RECTIFIER ASSEMBLY (1 REC)	1	
8-3	62-011-51	RECTIFIER ASSEMBLY (1 REC)		1
8-4	62-002-54	RECTIFIER ASSEMBLY (2 REC)	1	
8-4	62-011-52	RECTIFIER ASSEMBLY (2 REC)		1
8-5	62-002-54	RECTIFIER ASSEMBLY (5 REC)	1	1
8-7	62-002-56	RECTIFIER ASSEMBLY (3 REC)	1	
8-7	62-011-53	RECTIFIER ASSEMBLY (3 REC)		1
8-8	62-002-56	RECTIFIER ASSEMBLY (4 REC)	1	
8-8	62-011-54	RECTIFIER ASSEMBLY (4 REC)		1
8-9	62-002-58	TERMINAL BLOCK ASSEMBLY	1	1
8-11	62-002-59	SHUNT ASSEMBLY	1	
8-11	62-011-55	SHUNT ASSEMBLY		1
8-12, 12A	62-002-60	CAPACITOR	1	1
8-13	62-002-61	TRANSFORMER	1	
8-13	62-01-56	TRANSFORMER		1
8-14	62-002-62	CAPACITOR, COMMUTATING 200 VOLT	1	1
8-15	62-002-63	SNUBBER ASSEMBLY	2	2
8-16	62-002-64	THERMAL PROTECTOR	1	1
8-17	62-002-65	CONTROL TERMINAL BLOCK	1	1
8-18	62-002-66	COVER, TERMINAL BLOCK	1	1
8-25	62-002-67	SUPPORT, CARD BOX (LEFT HAND)	1	1
8-26	62-002-68	SUPPORT, CARD BOX (RIGHT HAND)	1	1
8-29	62-002-69	BUS	2	2
8-30	62-002-70	RESISTOR	1	1
8-31	62-002-51	CARD ASSEMBLY W/FLD. WEAKENING, SERIAL #IC3645OSC1C3	1	1
8-32	62-002-52	CARD ASSEMBLY W/O FLD. WEAKENING SERIAL #IC3645OSCC1D3	1	1
	94-422-00	GREASE, HEAT SINK	1	1

SUGGESTED SPARE PARTS LIST

FIG. I.D.	T-D PART NO.	DESCRIPTION	QTY 1-20 UNITS
REFER TO FIGURE 1, FORWARD/REVERSE SWITCH			
1-3	71-091-53	HANDLE AND HUB ASSEMBLY	1
1-1	71-091-51	COVER	1
1-8	71-091-58	SPRING, CAM FOLLOWER	1
1-11	71-091-60	SWITCH, FORWARD AND REVERSE	2
1-12	71-091-61	CAPACITOR ASSEMBLY	2
NOT SHOWN	71-091-71	MOUNTING CLAMP, STEERING COLUMN	1
REFER TO FIGURE 4, ACCELERATOR SWITCH			
4-1	61-912-51	SWITCH ASSEMBLY	2
4-10	61-912-61	SPRING, RETURN	2
4-13	61-912-64	POTENTIOMETER 5K, W/MOUNTING CLAMP	1
4-8	61-912-59	CAM SHAFT ASSEMBLY	1
NOT SHOWN	61-912-68	COVER	1
NOT SHOWN	61-912-66	HOSE	4
NOT SHOWN	61-912-67	CLAMP, HOSE	4
REFER TO FIGURE 5, 75A/24V CONTACTOR PANEL			
5-16	71-306-51	CONTACTOR, FWD, SINGLE POLE, DOUBLE THROW	1
5-17	71-306-58	CONTACTOR, REV, SINGLE POLE, DOUBLE THROW	1
5-18	71-306-52	CONTACTOR, 1A BY-PASS, SIN. POLE, SIN. THROW	1
5-49	78-306-00	RESISTOR	2
5-41	71-306-53	FILTER BLOCK, 1A	2
5-43	71-306-54	FILTER BLOCK, FWD/REV	2
REFER TP FIGURE 6 & 7, 150A-36/48V CONTACTOR PANEL			
6-10	71-305-70	CONTACTOR, FWD, SINGLE POLE, DOUBLE THROW	1
6-11	71-305-80	CONTACTOR, REV, SINGLE POLE, DOUBLE THROW	1
6-12	71-305-90	CONTACTOR, 1A, SINGLE POLE, DOUBLE THROW	1
6-25	71-305-54	CONTACTOR DRIVER	2
7-13	71-305-71	COIL, 36/48V., FWD/REV CONTACTORS	1
7-14	71-305-73	MOVING TIP ASSEMBLY, FWD/REV CONTACTORS	1
7-15	71-305-74	TERMINAL, L.H. TOP, FWD CONTACTOR	1
7-15	71-305-75	TERMINAL, R.H. TOP, FWD CONTACTOR	1
7-15	71-305-76	TERMINAL, L.H. BOTTOM, FWD CONTACTOR	1
7-15	71-305-77	TERMINAL, R.H. BOTTOM, FWD CONTACTOR	1
7-14	71-305-92	COIL, 24VOLT, 1A CONTACTOR	1
7-15	71-305-81	TERMINAL, R.H TOP, REVERSE CONTACTOR	1
7-15	71-305-82	TERMINAL, L.H. BOTTOM, REV CONTACTOR	1
7-15	71-305-83	TERMINAL, R.H. BOTTOM, REV CONTACTOR	1
7-13	71-305-91	COIL, 36/48, 1A CONTACTOR	1
7-15	71-305-93	TERMINAL, L.H., 1A CONTACTOR	1
7-15	71-305-94	TERMINAL, R.H., 1A CONTACTOR	1
7-14	71-305-95	MOVING TIP ASSEMBLY, 1A CONTACTOR	1
NOT SHOWN	71-305-61	KIT, 24 VOLT CONVERSION FOR 150 AMP CONTACTOR PANEL	1 (OPT)

REFER TO FIGURE 8, MODELS "A & B" CONTROL MODULES

FIG. I.D.	T-D PART NO.	DESCRIPTION	A	B
8-3	62-002-53	RECTIFIER ASSEMBLY, (1 REC)	1	
8-3	62-011-51	RECTIFIER ASSEMBLY, (1 REC)		1
8-4	62-002-54	RECTIFIER ASSEMBLY, (2 REC)	1	
8-4	62-011-52	RECTIFIER ASSEMBLY, (2 REC)		1
8-7	62-002-56	RECTIFIER ASSEMBLY, (3 REC)	1	
8-7	62-011-53	RECTIFIER ASSEMBLY, (3 REC)		1
8-11	62-002-59	SHUNT ASSEMBLY,	1	
8-8	62-011-54	RECTIFIER ASSEMBLY, (4 REC)		1
8-11	62-011-55	SHUNT ASSEMBLY		1
8-12, 12A	62-002-60	CAPACITOR	1	1
8-13	62-002-61	TRANSFORMER	1	
8-13	62-011-56	TRANSFORMER		1
8-14	62-002-62	CAPACITOR, COMMUTATING 200 VOLT	1	1
8-15	62-002-63	SNUBBER ASSEMBLY	2	2
8-16	62-002-64	THERMAL PROTECTOR	1	1
8-17	62-002-65	CONTROL TERMINAL BLOCK	1	1
8-18	62-002-66	COVER, TERMINAL BLOCK	1	1
8-25	62-002-67	SUPPORT, CARD BOX (LEFT HAND)	1	1
8-26	62-002-68	SUPPORT, CARD BOX (RIGHT HAND)	1	1
8-30	62-002-70	RESISTOR	1	1
8-31	62-002-51	CARD ASSEMBLY W/FIELD WEAKENING, SERIAL IC36450SC1C3	1	1
8-32	62-002-52	CARD ASSEMBLY W/O FIELD WEAKENING SERIAL IC36450SCC1D3	1	1
	94-422-00	GREASE, HEAT SINK		

T-D PART	GENERAL ELECTRIC PARTS DESCRIPTION	QTY.
MODEL B 2-48		
71-610-00	BRACKET, CIRCUIT BREAKER	3
71-610-10	BRACKET FOR MOUNTING CIRCUIT BREAKER BRACKETS TO VEHICLE	1
78-106-00	BUSS BAR, TERMINAL CONNECTING, 2 POLE, FOR CIRCUIT BREAKERS	2
79-843-10	CIRCUIT BREAKER, 90 AMP, SINGLE POLE	2
MODEL B 2-54		
71-610-00	BRACKET, CIRCUIT BREAKER	4
71-610-10	BRACKET FOR MOUNTING CIRCUIT BREAKER BRACKET TO VEHICLE	1
78-107-00	BUSS BAR, TERMINAL CONNECTING, 3 POLE, FOR CIRCUIT BREAKERS	2
79-843-00	CIRCUIT BREAKER, 100 AMP, DOUBLE POLE	1
79-843-11	CIRCUIT BREAKER, 100 AMP, TRIPLE POLE	1
MODEL B 2-56		
71-610-00	BRACKET, CIRCUIT BREAKER	3
78-107-00	BUSS BAR, TERMINAL CONNECTING, 3 POLE FOR CIRCUIT BREAKERS	2
79-843-00	CIRCUIT BREAKER, 100 AMP, DOUBLE POLE	1
79-843-11	CIRCUIT BREAKER, 100 AMP, TRIPLE POLE	1
MODEL E 4-51 (24 VOLT)		
71-610-00	BRACKET, CIRCUIT BREAKER	2
78-106-00	BUSS BAR, TERMINAL CONNECTING, 2 POLE, FOR CIRCUIT BREAKER	2
79-843-00	CIRCUIT BREAKER, 100 AMP, DOUBLE POLE	1
79-843-11	CIRCUIT BREAKER, 100 AMP, TRIPLE POLE	1
MODEL E 4-53 & E 4-57 36 VOLT 3.5 H.P. MOTOR		
71-610-00	BRACKET, CIRCUIT BREAKER	2
78-106-00	BUSS BAR, TERMINAL CONNECTING, 2 POLE FOR CIRCUIT BREAKERS	2
79-843-00	CIRCUIT BREAKER, 100 AMP DOUBLE POLE	1
79-843-11	CIRCUIT BREAKER, 100 AMP TRIPLE POLE	1
MODEL E 4-53 & E 4-57 36 VOLT 5.0 H.P. MOTOR		
71-610-00	BRACKET CIRCUIT BREAKER	3
78-107-00	BUSS BAR, TERMINAL CONNECTING, 3 POLE FOR CIRCUIT BREAKERS	2
79-843-00	CIRCUIT BREAKER, 100 AMP DOUBLE POLE	1
79-843-11	CIRCUIT BREAKER, 100 AMP TRIPLE POLE	1
MODEL P 2-49		
71-610-00	BRACKET, CIRCUIT BREAKER	4
78-107-00	BUSS BAR, TERMINAL CONNECTING, 3 POLE FOR CIRCUIT BREAKERS	2
NOTE: The following parts apply to those vehicles equipped with ev-1 SCR and optional equipment such as horns, windshield wipers, heaters, etc.		
78-500-00	HASH FILTER	
79-842-00	CIRCUIT BREAKER, 10 AMP, SINGLE POLE	
79-839-00	CIRCUIT BREAKER, 30 AMP, SINGLE POLE	
79-843-00	CIRCUIT BREAKER, 100 AMP, DOUBLE POLE	
79-843-11	CIRCUIT BREAKER, 100 AMP, TRIPLE POLE	



# **SPEED CONTROLLER**



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## INTRODUCTION

The all-new speed controller is developed and available only from Taylor-Dunn and is warranted for one (1) year. However, modifications to the control unit, drive or power system will void the warranty.

Your electronic controller is a solid-state voltage regulator designed specifically for use on electric vehicles. The control function is to regulate the power fed from the battery to the motor so as to provide full control of the vehicle speed under all operating conditions.

The controller regulates motor power by switching the current on and off at high speed. The average voltage applied to the motor is varied by adjusting the ON time with respect to the OFF time, in response to power demand from the accelerator.

This technique, done with power transistors, is called Pulse Width Modulation. It results in a smooth transition from full stop to full speed, without any discernible steps in-between. Also, power loss to control components is extremely low, resulting in greater driving range per battery charge.

Questions regarding your Taylor-Dunn speed controller can be answered by the Taylor-Dunn dealer in your area, who will also assist you should you need service. Any credit returns and/or warranty requests to Taylor-Dunn are also handled by the authorized dealer.

## SPEED CONTROL SYSTEM

Table 1, shown below, shows the controller installed for each vehicle. Each controller system consists of the control panel assembly, wire harnesses and accelerator module (Part No. 62-033-00).

All controllers can operate on 24 or 36 Volts DC. The 62-204-00 is for smaller vehicles. The 62-204-40 is sufficient for medium size burden carriers providing an "on demand" output of 400 amps. The largest controller, 62-205-00, is for heavy-duty burden carriers and tow tractors.

SPEED CONTROL SYSTEM					
VEHICLE MODEL	SPEED CONTROL	HARNESS CONTROL	HARNESS POWER	SOLENOIDS	
				ISOLATOR	FWD/REV
B 2-10 (36V)	62-204-40	75-148-78	75-149-78	72-501-38	72-501-39
B 2-38 (36V)	62-205-00	75-148-29	74-149-26	72-501-38	72-501-39
B 2-48 (36V)	62-205-00	74-148-29	75-149-26	72-501-38	72-501-39
B 2-80 (24V)	62-205-00	75-148-50	75-149-50	72-501-38	72-501-39
C 4-10 (36V)	62-205-00	75-148-74	75-149-77	72-501-38	72-501-39
C 4-15 (36V)	62-205-00	75-148-22	75-149-22	72-501-38	72-501-39
C 4-32 (36V)	62-205-00	75-148-23	75-149-23	72-501-36	72-501-37
C 4-33 (24V)	62-205-00	75-148-23	75-149-23	72-501-24	72-501-25
E 4-51 (24V)	62-205-00	75-148-12	75-149-12	72-501-24	72-501-25
R 3-80 (36V)	62-204-40	75-148-76	75-149-76	72-501-36	72-501-37
AN 1-71 (24V)	62-204-00	75-148-18	75-149-18	72-501-24	72-501-25
SC 1-59 (24V)	62-204-00	75-148-77	75-149-25	72-501-24	72-501-25
SC 1-75 (24V)	62-204-00	75-148-15	75-149-16	72-501-24	72-501-25
SS 5-34 (24V)	62-204-00	75-148-26	75-149-25	72-501-24	72-501-25

## FEATURES

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- ◆ Current Limit - Cold current limit is 275A for the 62-204-00 and 62-204-40, but the latter is capable of sustaining up to 400A for short periods of time (30 seconds or less). The 62-205-00 has a cold current limit of 400A.
- ◆ Thermal Roll-back - The controller will heat up if it is continuously overloaded. Above 150° F (65° C), the controller will shut down. When it cools down, full current limit and performance will return. As current rolls back, oscillation frequency will change so that the motor will generate a whining noise.

**Note:** *Thermal roll-back will not damage the controller. If it happens often, however, the controller is probably undersized for the operation, and another model with a higher current capacity should be used.*

**Note:** *Motor whine indicates overheating, most likely from overloading or system fault.*

- ◆ Acceleration Limit - Built-in acceleration ramp to prevent jackrabbit starts. It is permanently set to between 1 and 3 seconds, depending on the vehicle.
- ◆ High Pedal Disable - If the accelerator pedal is depressed at the time the controller is turned on, the controller will inhibit current output to the motor. The pedal has to be released and reapplied before the motor will run. This safety feature requires the operator to accelerate smoothly from a standing start.

## CIRCUITS AND OPERATION

### CIRCUITS

There are two circuits included in the operation of the controller - the control circuit and the power circuit.

The control circuit (light gauge wire) connects the key switch, seat switch (available on some models only), accelerator module, solid-state controller, forward-reverse switch and solenoids.

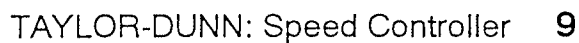
The power circuit (heavy gauge wire) connects the batteries, controller, solenoids, and motor.

### OPERATION

To put your vehicle in operation, turn the ignition key to "ON". Select travel direction by moving the forward-reverse switch to the desired position. Release the park brake. Slowly depress the accelerator pedal until the vehicle is moving at desired speed.

You will notice your vehicle has a smooth transition from start to high speed operation. This is a built-in characteristic of the speed controller avoiding jackrabbit starts.

It is recommended when starting the vehicle to always turn the ignition key on first, then select travel direction with the forward-reverse switch BEFORE depressing the accelerator pedal.





## PREVENTIVE MAINTENANCE

### **WARNING!**

Before working on the controller units or any part of the vehicle system, disconnect both the main positive and negative battery leads. Place the forward-reverse switch in neutral, turn off and remove the key. Always set the parking brake.

Be sure the ignition key is in the "ON" position before depressing the accelerator pedal. DO NOT depress the pedal before turning on the key - this is unsafe operation.

### **Caution!**

Do not steam clean or spray with water.

Make sure all wire connections are secure.

When returning the vehicle to pre-service configuration make certain batteries are properly connected to avoid damage.

## REPAIR OR REPLACEMENT OF PARTS

a. Wiring - the positions of all wires and lugs should be noted and marked prior to removal to avoid confusion on replacement.

b. Connection - Check all connections for tightness on completion.

c. Final Checks - Prior to the first switch on, check battery polarity. Use testlight to ensure safety.

Replace solenoids only with the same Taylor-Dunn part as originally supplied.

Replace accelerator module 62-033-00 as a unit, except for the spring. It is NOT designed to be serviced in the field.

Replace the controller as a complete unit. There are no user-servicable parts inside.

### **Accelerator Module**

The accelerator module was designed to increase the reliability of the control system. The module requires very low maintenance and the components give solid state performance.

**Note:** *There are no adjustments that need to be made to the accelerator module. However, make sure the accelerator pedal is up and the accelerator lever is resting against the accelerator bracket. This is the off position.*

### **Speed Control Module**

The speed control module consists of:

- ♦ Solenoids
- ♦ Speed controller
- ♦ Circuit breakers

### **Solenoid Assembly**

### **WARNING!**

Disconnect the main battery leads and remove the key before working on any part of the vehicle's electrical system.

**Note:** *Mark the position of all wires and buss bars prior to removal. Make sure they are put back in their original position.*

### **Speed Controller**

The controller is designed specifically for use with electric vehicles. Its function is to provide full control of the vehicle's speed under all operating conditions.

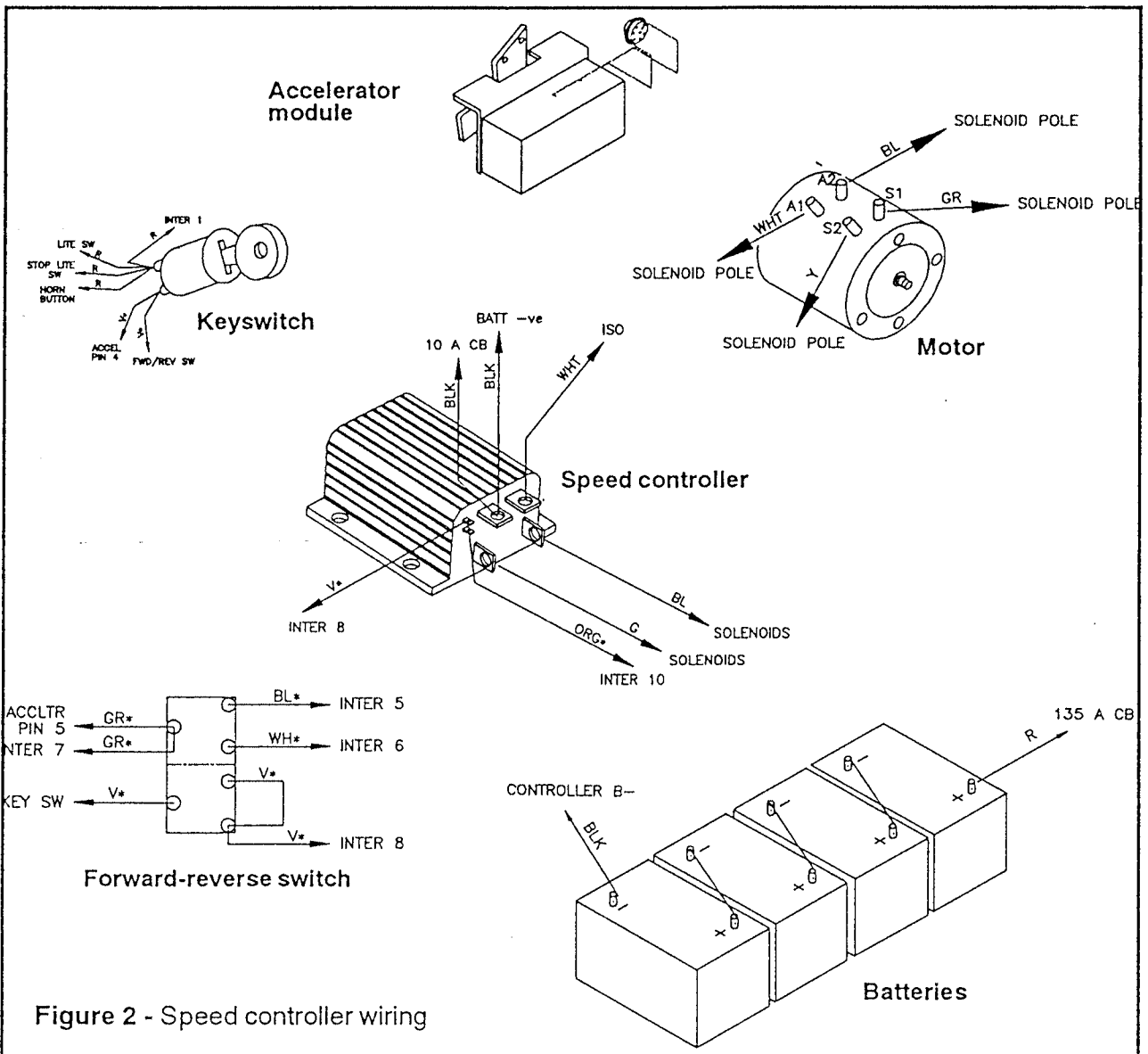


Figure 2 - Speed controller wiring

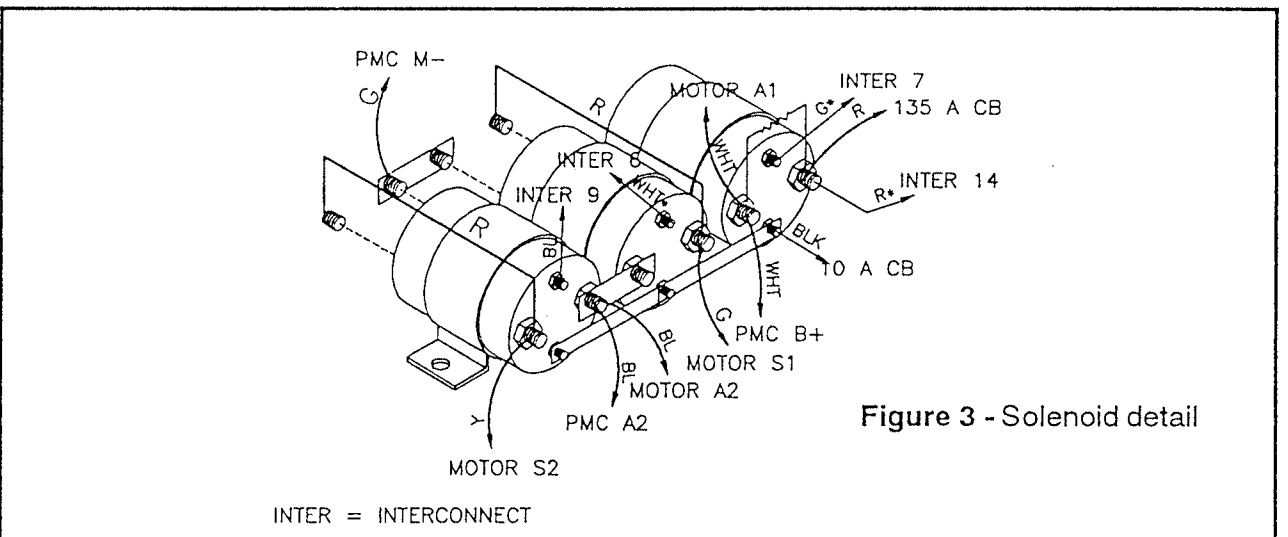


Figure 3 - Solenoid detail



## TROUBLESHOOTING GUIDE

**Note:** Before proceeding with any troubleshooting, understand the basic principles of operation and be familiar with component testing and replacement procedures.

### **WARNING!**

Disconnect the main battery leads and remove the key before working on any part of the electrical system.

### Testing the Accelerator Module

To test accelerator module do the following:

- 1** Visually inspect the accelerator spring. Replace in case of cracks or damage.
- 2** Visually inspect the bushings. Replace if worn or damaged.
- 3** Unplug the accelerator wire harness.
- 4** Using an accelerator module test box (Part Number 62-027-30), plug in the accelerator module pigtail.
- 5** Connect the B+ and B- terminals on the test box to the battery main positive and negative terminals.

**Note:** Make sure the batteries are in good condition and fully charged.

- 6** Set the V.O.M. to DC volt range to make the measurements. All readings must agree with the following tables.
- 7** With the pedal up, the following measurements should be found.

Pin Position	Pedal Up
2	0 Volts
4	Battery Voltage
5	0 Volts
6	0 Volts

- 8** Slowly depress the pedal. When pin No. 5 first measures battery voltage, the following measurements should be found:

Pin Position	#5 at Battery Voltage
2	6.0 - 6.3 Volts
4	Battery Voltage
5	Battery Voltage
6	0 Volts

- 9** With the pedal fully depressed, the following measurements should be found:

Pin Position	Pedal Fully Depressed
2	11.0 - 11.5 Volts
4	Battery Voltage
5	Battery Voltage
6	Battery Voltage

- 10** If the accelerator module fails it will need to be replaced.
- 11** Unplug the test pigtail and plug in the accelerator wire harness.

## Test for Solenoid Operation

### **WARNING!**

Raise and brace the rear of the vehicle. The drive wheels must not touch the ground. Always use jack stands of adequate capacity when supporting the vehicle. Perform this operation only on a flat, level surface.

To check for solenoid operation do the following:

- 1** Disconnect the wire that connects the motor S1 lead to the solenoids. Install a test light (Part # 62-027-00) in place of this wire.
- 2** Place the forward/reverse switch in the off position.
- 3** Turn the ignition key on and depress the pedal until the first microswitch in the accelerator module operates.
- 4** The lamp should go smoothly from full off to full on. If it does not, the controller is bad and should be replaced.
- 5** Measure the voltage across the coil terminals on the isolator solenoid. You should measure full battery voltage.
- 5** Place the forward/reverse switch in reverse.
- 6** Measure the voltage across the reverse solenoid. You should measure full battery voltage.
- 7** Place the forward/reverse switch in forward.
- 8** Measure the voltage across the forward solenoid. You should measure full battery voltage.
- 9** If the voltage reading is low, check for loose, faulty or misconnected wires, keyswitch, or forward/reverse switch.

- 10** If the solenoid coils and keyswitch input are getting voltage, make sure the solenoids are working by connecting the voltmeter across the power terminals. Contacts should show no voltage drop.

- 11** If a voltage reading indicates bad or worn contacts, replace the solenoid.

## Testing Speed Controller Wiring

### **WARNING!**

Raise and brace the rear of the vehicle. The drive wheels must not touch the ground. Always use jack stands of adequate capacity when supporting the vehicle. Perform this operation only on a flat, level surface.

To test controller power, do the following:

### **Caution!**

Check the batteries' polarity. Severe damage to the controller will result if battery polarity is reversed.

**Note:** *Make sure the batteries are fully charged before proceeding.*

- 1** Make sure that the keyswitch is in the off position.
- 2** Check to see that the negative ( - ) battery terminal is connected to the B- terminal of the controller.
- 3** Connect the negative ( - ) voltmeter lead to the controller B- terminal.
- 4** Connect the positive ( + ) voltmeter lead to the battery side of the isolator solenoid.
- 5** The measurement should be full battery voltage.

**Note:** *If voltage is not present, check for loose wires, bad batteries, or faulty main circuit breaker.*

- 6** Connect the positive (+) voltmeter lead to the controller B+ terminal.
- 7** The voltmeter should have a voltage reading of 1 to 5 volts less than full battery voltage.

**Note:** *If the voltage is zero or close to zero, the trouble is either a defective controller, a defective resistor across the isolator solenoid, or the wire between the isolator solenoid and the controller. If the voltmeter reads full battery voltage, then the isolator has welded and must be replaced.*

- 8** Trace the wire to make sure it is connected correctly.
- 9** Remove and test the resistor on the isolator solenoid with an ohmmeter. The ohmmeter should read 250 ohms.

## Testing Controller Output

**Note:** *This test assumes that the accelerator module has been previously tested and is known to be functioning properly.*

**Note:** *The test is best performed with an analog voltmeter. Digital meters may provide erratic readings.*

- 1** Raise and brace the rear of the vehicle and support it. The drive wheel must not touch the ground.

### **WARNING!**

**Always use jack stands of adequate capacity when supporting the vehicle. Perform this procedure ONLY on a flat, level surface.**

- 2** Connect the positive (+) voltmeter lead to the controller M- terminal.
- 3** Connect the negative (-) voltmeter lead to the controller B- terminal.
- 4** Turn on the keyswitch.

- 5** Put the forward/reverse switch in forward or reverse.

- 6** Operate the accelerator over its full travel while monitoring the voltmeter. The voltmeter should read nearly full battery voltage with the pedal at minimum speed and drop smoothly to near zero volts with the pedal all the way down. It also should be noted that the speed of the rear wheels progressively increases as the accelerator pedal is depressed.

- 7** If no voltage or low voltage readings are observed and the wheel speed is low, check the wiring, connections, solenoid, and motor for poor connections or open circuits.

- 8** If the voltage reading is correct at the top of the pedal travel but does not drop, check the accelerator module input to the controller. It should vary from 6 to 11 volts with respect to the B- terminal over the full travel of the accelerator module.

- 9** Check for battery voltage on the KSI terminal on the controller.

- 10** Measure the current in the M- lead while operating the accelerator over its full travel. The current should gradually increase as the accelerator is depressed to a level of 25-60 amps.

**Tip:** *Use a shunt/meter setup or a clamp-on DC ammeter to measure the current.*

- 11** If current is flowing in the M- lead but the wheel speed is not correct, there is probably a short in the motor or wiring.

If the results of these tests are normal but the vehicle does not operate properly, the free wheeling or plug diode in the controller may be faulty.

---

### Checking the Plug Diode

---

To check the plug diode do the following:

- 1** Disconnect the battery leads.
- 2** Disconnect the A2 terminal on the controller.
- 3** Connect an ohmmeter capable of testing silicon diodes between the A2 and the B+ terminals on the controller.

The ohmmeter should show a low resistance with the leads connected one way and a high resistance with the leads reversed.

---

### Checking the Freewheeling Diode

---

To check the freewheeling diode, do the following:

- 1** Disconnect the cable from the M- terminal on the controller.
- 2** Connect the ohmmeter between the M- and B+ terminals on the controller.
- 3** The ohmmeter should show a low resistance with the leads connected one way and a high resistance with the leads reversed.
- 4** If either of the diodes appear to be defective, replace the controller.

---

### Controller Bench Test

---

#### EQUIPMENT

To test the controller on the bench will require the simple setup shown below. You will need the following:

- 1** A power supply with voltage equal to the rating of the controller to be tested. This can be a string of batteries or a regulated line operated power supply. Since only low power tests will be described, a 10 amp fuse should be wired in series with the batteries to protect both operator and controller against accidental shorts.

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#### **WARNING!**

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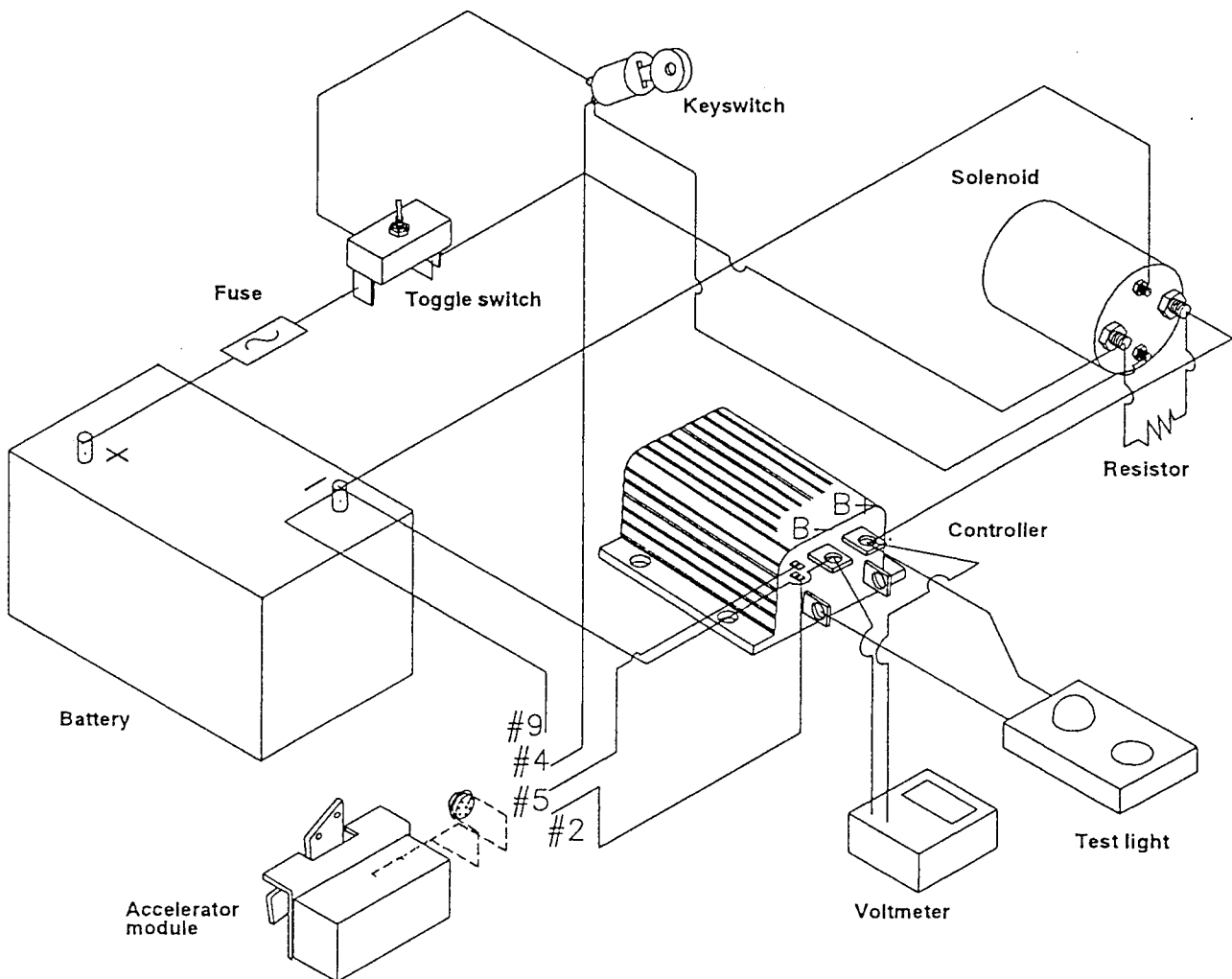
**A battery charger should not be used alone as a power supply, since without a battery load its output voltage may exceed the rating of the controller.**

---

- 2** A controlled input source. Use a 62-033-00, solid-state accelerator input configuration, wired as shown.
- 3** A solenoid with a 250 ohm, 5 watt resistor across its contacts, and a toggle switch to turn it on and off.
- 4** A test load, test light (62-027-00) set to the same voltage as your power supply.
- 5** A general purpose volt ohmmeter or digital voltmeter.

**BENCH TEST PROCEDURE**

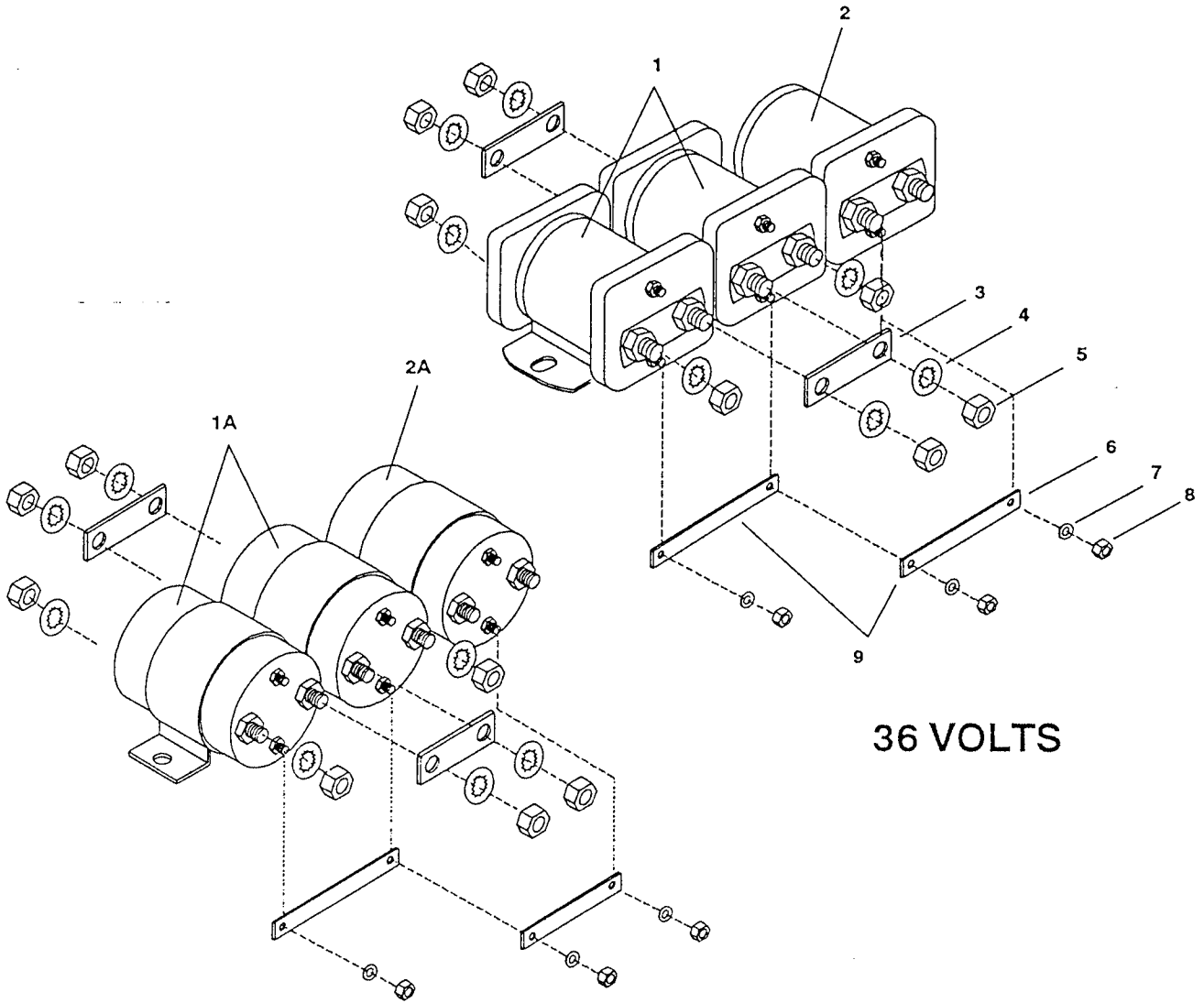
- 1** Pick up the controller and shake it. If anything in it rattles, it must be considered defective. Do not proceed with any more testing.
- 2** Hook up the controller as shown, and connect the voltmeter leads to the controller B+ and B- terminals.
- 3** Turn on the power supply (not the solenoid) and watch the voltmeter. Its reading should build up slowly over several seconds to full battery voltage. If the voltage does not come up, the controller is bad.
- 4** The lamp should not come on at this point. If it does, the controller is bad.
- 5** Turn on the switch operating the solenoid and the keyswitch input to the controller.
- 6** Move the accelerator arm and watch the lamp brightness. The lamp should go smoothly from full off to full on. If it does not, the controller is bad.



**Figure 4 - Controller bench test set up**

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## SOLENOIDS



36 VOLTS

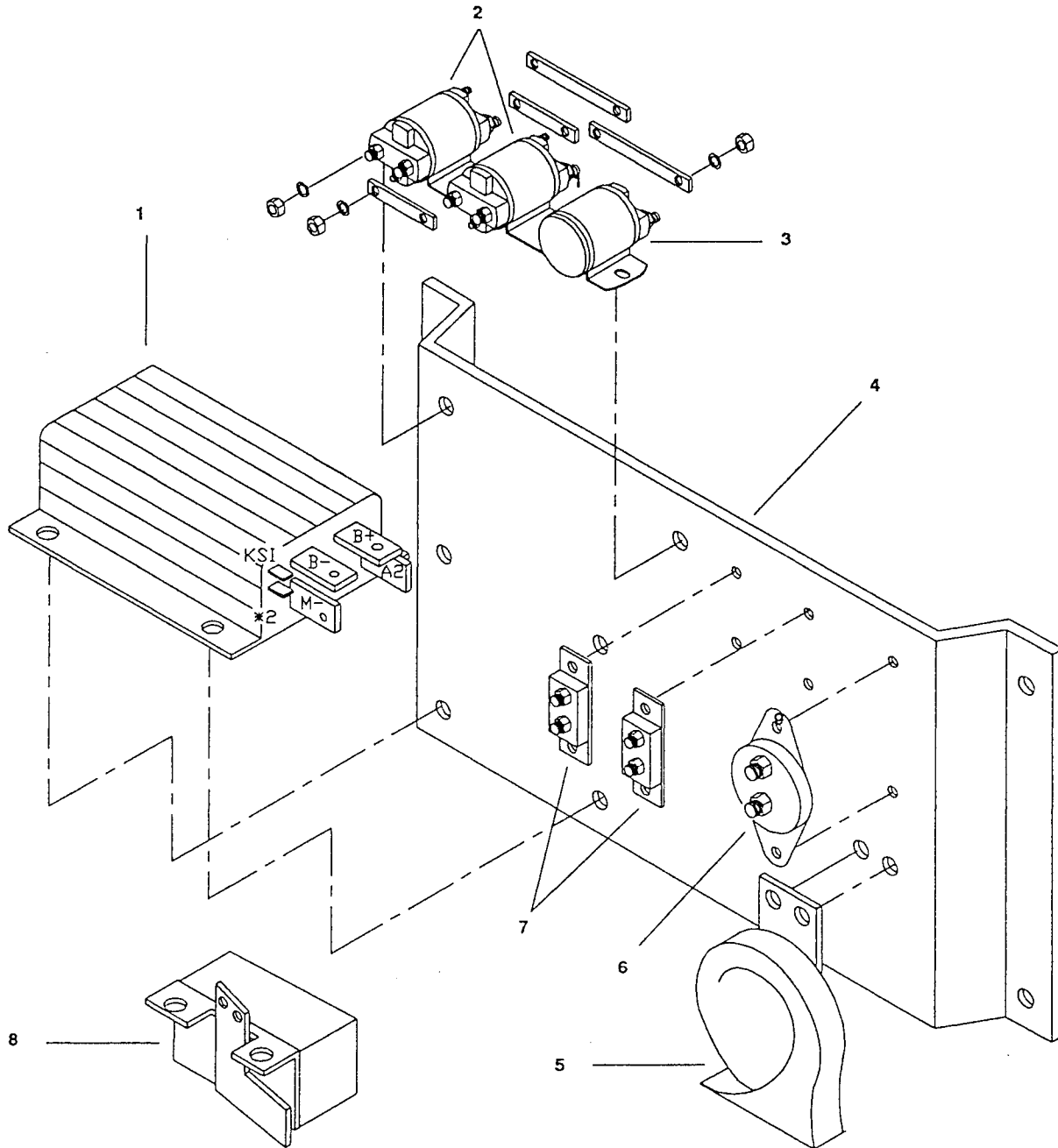
24 VOLTS



ASSEMBLY, SOLENOID, 36/24V			
ITEM #	PART NO.	DESCRIPTION	QTY
1	72-501-25	SOLENOID, SPDT 24V, 100A	2
1A	72-501-37	SOLENOID, SPDT 36V, 100A	2
1B	72-501-39	SOLENOID, SPDT, 36V, 200A	2
2	72-501-24	SOLENOID, SPST 24V, 100A	1
2A	72-501-36	SOLENOID, SPST 36V, 100A	1
2B	72-501-38	SOLENOID, SPST, 36V, 200A	1
3	61-838-41	Buss Bar, 5/8 X 1 1/2 HC	1
4	88-088-63	5/16 Lockwasher, INT	8
5	88-049-80	Nut, Hex Head	6
6	61-838-42	Buss Bar, 3/8 X 2 5/8 HC	2
7	88-048-62	#10 Lockwasher	5
8	88-099-91	5/16 Thin Pattern Nut	8



## CONTROL PANEL



SPEED CONTROL PANEL			
ITEM #	PART NUMBER	DESCRIPTION	QTY.
1	62-204-00	Controller, 275 A	1
1A	62-204-40	Controller, 275/400 A	1
1B	62-205-00	Controller, 400 A	1
2	SEE "SOLENOID ASSEMBLY," pp. 18-19		2
3			1
4	01-534-80	Panel, Control Mounting	1
5	73-004-20	Horn, 12V, Short Mount	1
6	79-844-00	Breaker, Klaxon, Auto Reset	1
7	79-840-00	Breaker, 10 amp, Auto Reset	2
7A	79-844-20	Breaker, 200 amp, Auto Reset	2
8	62-033-00	Accelerator Module	1
9	75-148-25	Harness, Control Panel (Not Shown)	1

SPEED CONTROL  
PARTS LIST

---

VEHICLE:	B 12-56
SPEED CONTROL OPTION:	KB-C01-59

---

CONTROL PANEL ASSEMBLY:	K9-014-98
SPEED CONTROLLER:	K4-058-77
CONTACTORS:	
FORWARD / REVERSE:	71-305-90
ISOLATOR	71-305-91
CONTROL MOUNTING PANEL:	K9-014-92
HORN:	73-002-00
CIRCUIT BREAKERS:	
100 AMP / 3 POLE:	79-843-11
20 AMP AUTO REST:	79-840-20
BUSS-BAR 3 POLE:	78-107-00
HARNESSES:	
CONTROL PANEL HARNESS:	75-148-25
POWER HARNESS:	K9-014-94
RESISTOR ASSEMBLY:	
250 OHM, 5 WATT	78-302-50
ACCELERATOR CONTROL:	62-033-00
DIRECTIONAL SELECTOR:	71-091-00
IGNITION SWITCH:	71-120-00
HARNESSES:	
CONTROL HARNESS:	75-148-29
SUPPLEMENTAL HARNESS:	K9-014-95

MAINTENANCE PROCEDURES

GENERAL ELECTRICAL SYSTEM

Your electrical system has been installed with care, utilizing quality materials for safe trouble free service. Proper fuses have been located where necessary to prevent unsafe overloads and protect the wiring from being damaged from short circuits.

Little care will be required, except for an occasional visual inspection for loose connections or some unusual condition causing the insulation to be rubbed off a wire.

Normal replacement parts such as light bulbs, fuses, flasher etc. have been arranged for simple changing by plug in devices or conveniently located terminals.

CAUTION:

1. Never perform maintenance on any part of the electrical system without disconnecting the main battery leads, placing the forward/reverse switch in Neutral and removing the key from the keylock.
2. A blown fuse is usually indicative of a short circuit or faulty device. Care should be exercised to remove the faulty condition before replacing fuse. DO NOT place larger capacity fuses or "jumpers" to overcome the condition as serious wiring damage can occur.

MAINTENANCE PROCEDURES  
BATTERIES

WARNING: Lead acid batteries continuously emit highly explosive gases. Flame or sparks must be kept away from the batteries at all times.

This emission is greatly increased during the charging process. Any area in which charging batteries are confined must be well ventilated, and flame or sparks must be kept out of the charging area and away from ventilator openings. DO NOT disturb battery connections while batteries are being charged.

The lead acid battery (or batteries) will furnish all power required by your vehicle. Two types are generally employed. The electric vehicle type battery pack, commonly used, can be expected to have a life of approximately 2 years, or 350 to 400 cycles. One cycle is the discharging and charging of the battery within proper limits. The heavy duty industrial type of battery has a life of approximately 7½ years, or 1800 cycles, with appropriate use and care.

It cannot be over emphasized how important good maintenance procedures and careful care of your batteries will affect their useful life. It is therefore recommended that a comprehensive maintenance program be established and adhered to throughout the life of your vehicle. A 5 point program is outlined below to assist you in understanding and establishing good battery care.

1. CORRECT CHARGING

Poor charging practices are responsible for more short battery life than any one other item. The charging equipment must be properly maintained and adjusted to give a charge which the battery will accept with maximum efficiency. Two things are involved in correct charging. These are the charging rate in amperes and the termination of the charge at the correct time. No amount of overcharging will increase the battery capacity or raise the specific gravity above its full charged condition.

Overcharging will reduce battery life. Undercharging will cause poor vehicle performance, and shorten the life of all electrical components, including the batteries. Refer to Service and Adjustment, Section J8, for proper methods to determine charge condition.

2. DISCHARGING - CAPACITY

Batteries are commonly rated in ampere hours at the six hour discharge rate to a final voltage of 1.75 per cell. They will deliver additional capacity in an emergency, but should not be required to do so regularly. The best way to avoid discharging is to prepare a rigid schedule for charging batteries which will insure against their being discharged beyond the limits of their capability.

3. WATERING

Water must be replaced from time to time. The frequency and quantity depends upon the watering space above the plates and the amount of gassing which the battery does on charge. Only approved or distilled water should be added to the battery. Water should be added after hydrometer or voltmeter readings have been taken. The liquid level within the battery raises as the gassing occurs. Thus filling after charging minimizes over-filling. However, the water level should cover the plates prior to charging.

MAINTENANCE PROCEDURES  
BATTERIES

4. CLEANING

Batteries pick up various kinds of dirt and dust, depending on their surroundings and the type of service they are subject to. This is usually dry dirt, which can readily be blown off with low pressure air or brushed off. However, if cells are overfilled and electrolyte collects on the covers, the top of the battery becomes wet and stays wet, since the acid in the electrolyte does not evaporate. This moist surface in combination with certain kinds of dirt becomes electrically conductive and permits stray currents to flow externally over the top of the battery. These currents cause corrosion of cell posts, nuts, connectors and steel trays, which eventually become troublesome and expensive to repair.

When wet dirt accumulates on top of the battery, remove it by washing the battery with a strong solution of baking soda and hot water (1 lb. of soda to 1/2 gallon of water). A convenient brush to use is one having flexible bristles like an old paint brush. Continue the application of the soda solution until all fizzing stops, which indicates that the acid has been neutralized. Then rinse thoroughly with clear water.

Wet covers can be indication of overfilling, leaky seals at posts and covers or of excessive gassing during charge. When observed the cause should be determined and the abusive conditions corrected.

5. RECORDS

A battery record system is recommended for all vehicles. It is considered essential for large operations, and where minimum battery operating cost is desired. A properly supervised record system can be made to detect and call attention to such operating irregularities as:

- a. Overcharging
- b. Undercharging
- c. Overdischarging
- d. Excessive Water Consumption
- e. Cleanliness
- f. Worn out Batteries
- g. Excessive Current Consumption on Trucks

It is not advisable to allow a battery to stand for a long period of time in a low state of charge. Doing so subjects the battery to excessive plate erosion and in cold climate conditions the electrolyte will freeze at a much higher temperature. For example, a fully charged battery will not freeze at temperatures near 60° below zero. Yet a battery in a very low state of charge may freeze at temperatures around 10° to 15° above zero.

A battery not in use maintains small amounts of chemical action which slowly tends to dissipate the charged condition. It is wise to re-charge a battery not in use every 1 to 2 months. If possible store the battery in a cool place, as the self discharge rate is increased with warmer temperatures.

## BATTERY MAINTENANCE RECORD

VEHICLE NO.

Battery No.	Cell No.	Date			Date			Date		
		Water OK or Low	Gravity Before Charge	Gravity After Charge	Water OK or Low	Gravity Before Charge	Gravity After Charge	Water OK or Low	Gravity Before Charge	Gravity After Charge
1	1									
	2									
	3									
2	1									
	2									
	3									
3	1									
	2									
	3									
4	1									
	2									
	3									
5	1									
	2									
	3									
6	1									
	2									
	3									

1. CAUTION: Batteries emit explosive gases. During normal operation the concentration of these gases is rarely sufficient to be considered dangerous unless flame or sparks occur in the battery compartment close to the vent holes in the battery caps. It is important that this not be allowed to occur at anytime. During the charging process, emissions are greatly increased. Any area in which charging batteries are confined must be well ventilated, and flame, sparks, or lighted cigarettes must be kept out of the charging area and away from ventilator openings associated with the charging area. Battery connections must not be disturbed while batteries are being charged.
2. Do not fill an uncharged battery. Bring water level up to just cover the plates, and complete filling after battery is fully charged. Use distilled water. Fill only to level indicated on battery.
3. Batteries which require unusually frequent watering may indicate overcharging. Review charging practices and/or adjustment of transformer taps in charger.
4. Gravity should be kept between 1175 (30% charged) and 1260 (100% charged), and gravity readings of all cells should be within 10 point range. When they are not, an equalizing charge should be applied. Refer to information under "Charging Time Chart" in Charger Handbook.
5. Periodically check for loose terminal posts or loose connections to terminal posts, but not while batteries are being charged.
6. Keep tops of batteries clean, and free of moisture, grease, and acid films. Any of these can cause current leakage.
7. Keep weekly (or oftener) record as shown in above sample chart, for a new vehicle or when charging results seem unsatisfactory, until satisfactory charging continues for a four week period, then keep record on a monthly basis.



## LESTER CHARGER TROUBLESHOOTING

*Model 7460 type 36LC25-8ET and Model 10505 type 24LC25-8ET*

### **⚠ WARNING**

*HIGH VOLTAGE and HIGH DC CURRENT.*

If you do not understand any part of these tests, refer testing to a qualified electrical mechanic.

### **⚠ WARNING**

*Prevent the truck from moving.*

Before performing maintenance on any vehicle, disconnect the batteries, set the parking brake and block the wheels

- 1) Disconnect the charger from the AC and DC source.
- 2) If this is a built in charger then remove the charger from the truck.
- 3) Remove the charger cover.

### **⚠ WARNING**

*High voltage may be stored in the capacitor.*

Discharge capacitor with insulated screwdriver before proceeding. Do not touch screwdriver blade while discharging capacitor.

- 4) Inspect all internal wiring and repair as necessary.
- 5) Inspect fuse link and replace if bad.
- 6) Test diodes.
  - A) Use a VOM set at R x 100 ohms scale.
  - B) Remove one lead from one diode (Fig. 1)
  - C) Connect test leads across one diode. Meter should either deflect to right side of scale or not at all.
  - D) Reverse polarity on diode test leads. You should get the opposite reading of previous test.
  - E) If you get the same reading in both polarities then the diode is bad.
  - F) Repeat the test on the other diode.
- **NOTE:** *It is recommended to replace the diodes as a set.*
  - G) Reconnect the lead removed in step 6B to the diode.
- 7) Test Capacitor.
  - A) Use an analog VOM set at its highest ohms scale. Preferably R x 10000.

### **⚠ WARNING**

*High voltage may be stored in the capacitor.*

- B) Discharge capacitor with insulated screwdriver. Do not touch screwdriver blade while discharging capacitor.
- C) Disconnect one lead from the capacitor.
- D) Connect the test leads across the capacitor.

The needle should deflect to low ohms reading and then slowly return to infinity (left side of scale). If the needle stays on low ohms reading or does not deflect at all then the capacitor is bad.

➤ **NOTE:** *Check capacitor in both polarities*

- E) Reconnect the lead removed in step 7C.





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Commercial and Industrial Vehicles Since 1949

- 8) Reconnect the DC source only.
- 9) Measure DC voltage from diode block (+) to fuse assembly (-) (Fig 1).
  - A) If you do not get battery voltage then the wiring to the battery is bad.
  - B) Reconnect the lead removed in step 7C to the capacitor.
- 10) If equipped with an ammeter then check the continuity across the meter.
  - A) If you do not get 0 ohms then the meter is bad.

**⚠ WARNING**

*Electrical shock hazard!*

After next step there will be un-insulated high voltage in charger.

- 11) Reconnect the AC source.

**⚠ WARNING**

*The charger must be grounded!*

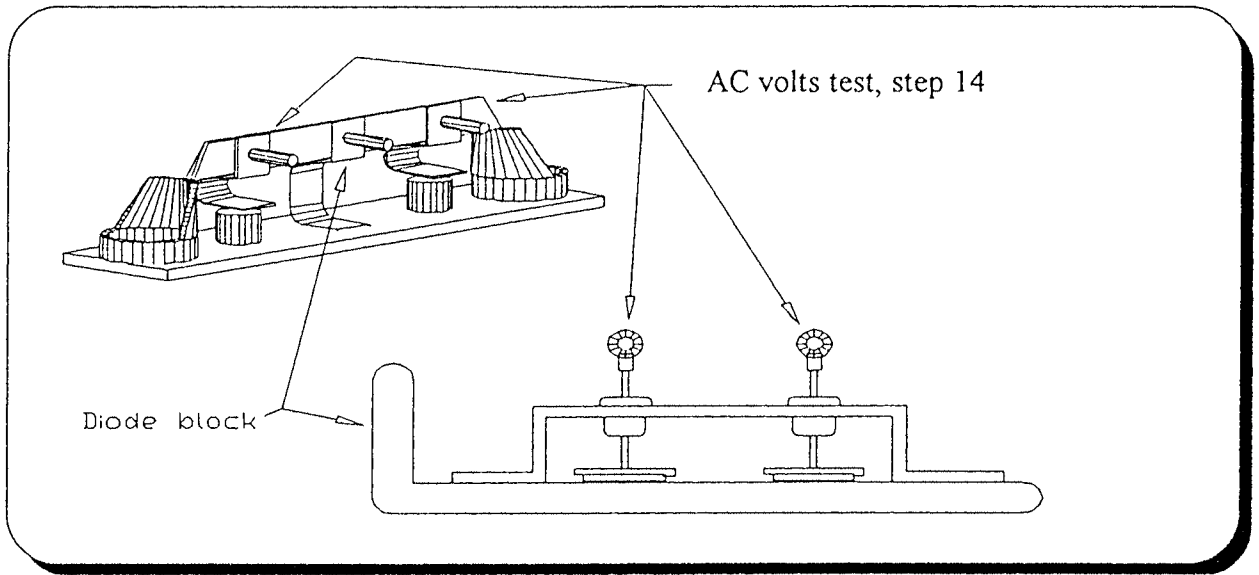
The Green wire from the AC cord must be electrically attached to the charger cabinet.

**⚠ WARNING**

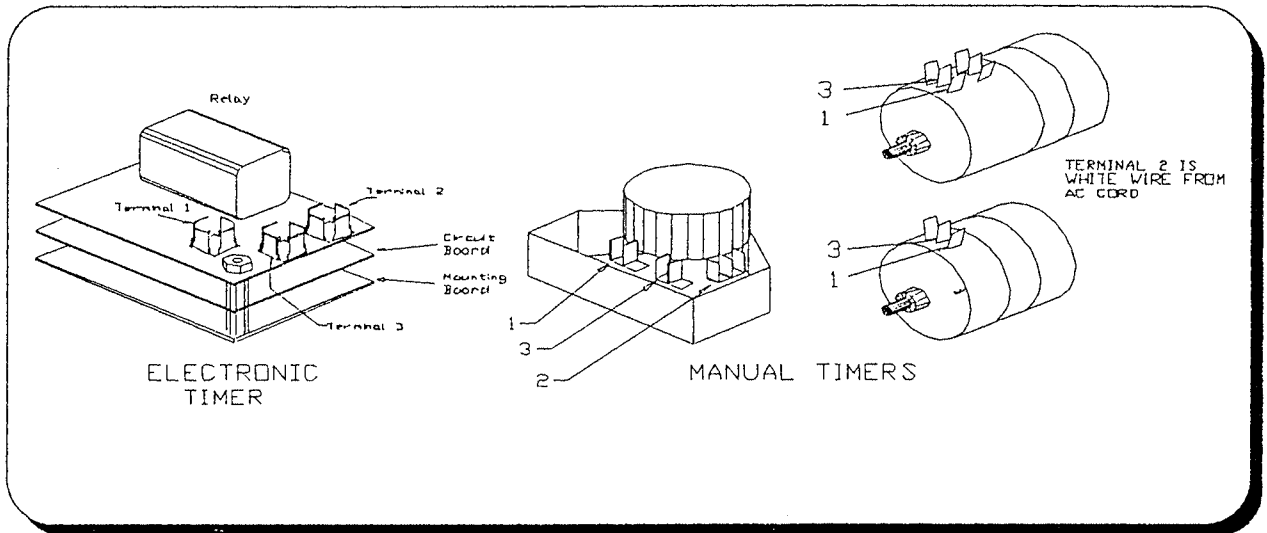
*Repairs to house wiring must be done by a qualified electrician.*

- 12) Measure AC input voltage at 1/4" spade connectors on timer (Fig. 3, Terminals 1 and 2).
  - A) If not at approximate charger AC voltage listed on spec plate, then AC input is bad.Possible problems;
  - B) Wiring to AC cord,
  - C) AC cord or plug,
  - D) House wiring or circuit breaker. To test, plug a known to be good light into the wall receptacle.
- 13) Measure AC output voltage at timer (Fig. 2 terminals 2 and 3).
  - A) If it is not the same as the input voltage then the timer is bad.
- 14) Measure AC voltage at diodes.
  - A) 36v charger-If not 75-90 vac then the transformer is bad.
  - B) 24v charger-If not 50-60 vac then the transformer is bad.







Diode set (typical)

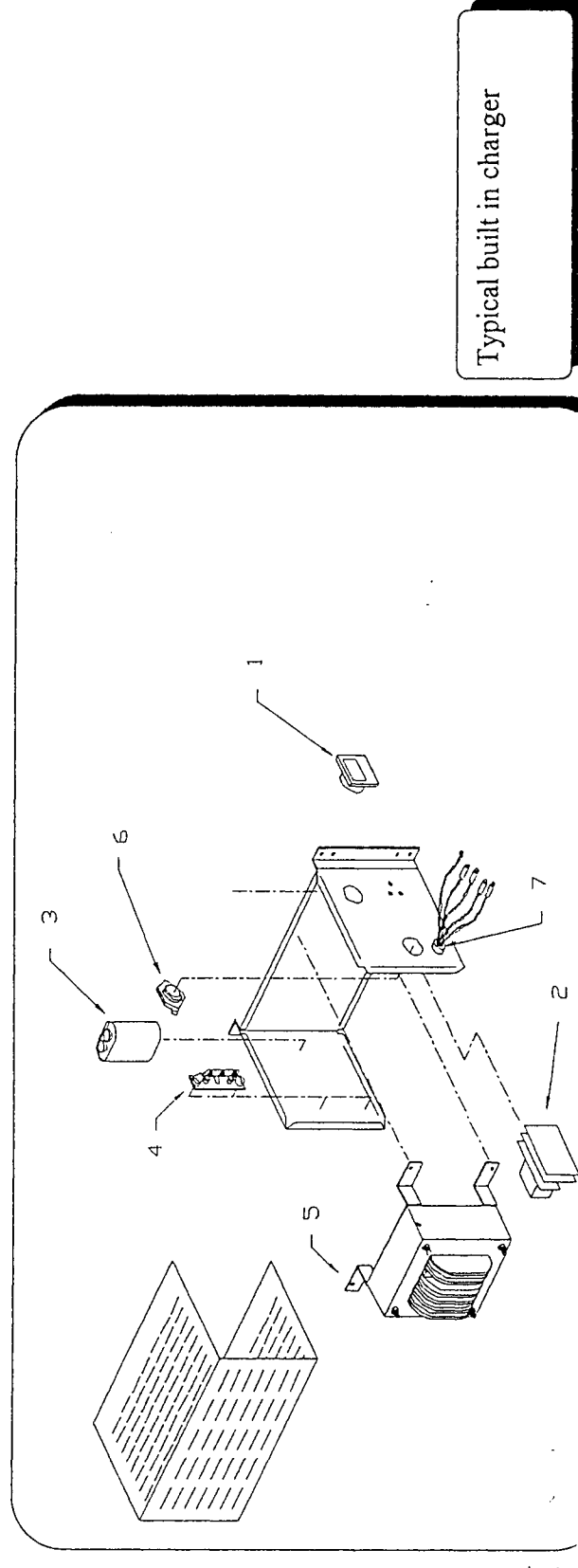


Timer (typical)



**TAYLOR-DUNN**  
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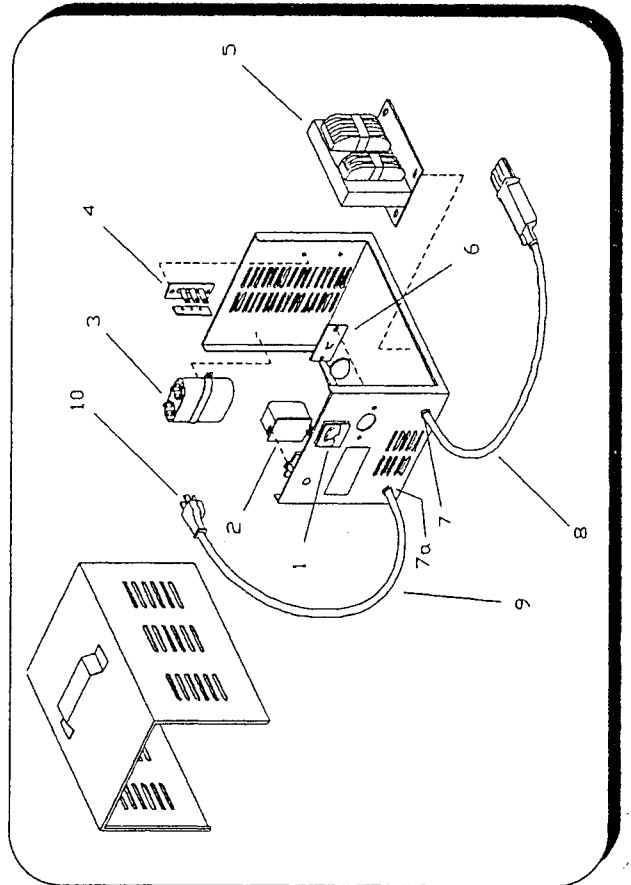
ITEM #	DESCRIPTION	PART #						
		BUILT IN (Lestronic 2)						
	Charger type 	24v25a	24v40a	36v25a	36v40a	48v25a	Built in (standard)	
	Lester Model # 	10505	13760	7460	13745	16910	48v25a	
	Charger assy.	79-301-05	79-302-15	79-305-05	79-306-25	79-309-10	7635	
1	Ammeter	79-851-10	79-852-00	79-851-10	79-852-00	79-851-10	79-308-05	
2	Timer	79-805-66	79-805-66	79-805-67	79-805-67	79-805-68	79-851-10	
3	Capacitor	79-902-00	79-902-00	79-902-00	79-902-00	79-902-00	79-805-60	
4	Diode assy.	79-749-13	79-749-10	79-749-13	79-749-10	79-749-13	79-902-00	
5	Transformer	79-644-29		79-644-31			79-749-13	
6	Fuse	79-831-00	79-831-11	79-831-00	79-831-11	79-831-00	79-644-24	
7	Bushing (DC)	-----	-----	-----	-----	-----	79-831-00	
7a	Bushing (AC)	79-530-00	79-530-00	79-530-00	79-530-00	79-530-00	-----	
7b	Bushing (harness)	79-530-00	79-530-00	79-530-00	79-530-00	79-530-00	79-530-00	
8	DC cord	-----	-----	-----	-----	-----	79-530-00	
9	AC cord	79-575-30	79-575-30	79-575-30	79-575-30	76-575-30	76-575-30	
10	AC plug	76-200-00	76-200-00	76-200-00	76-200-00	76-200-00	76-200-00	





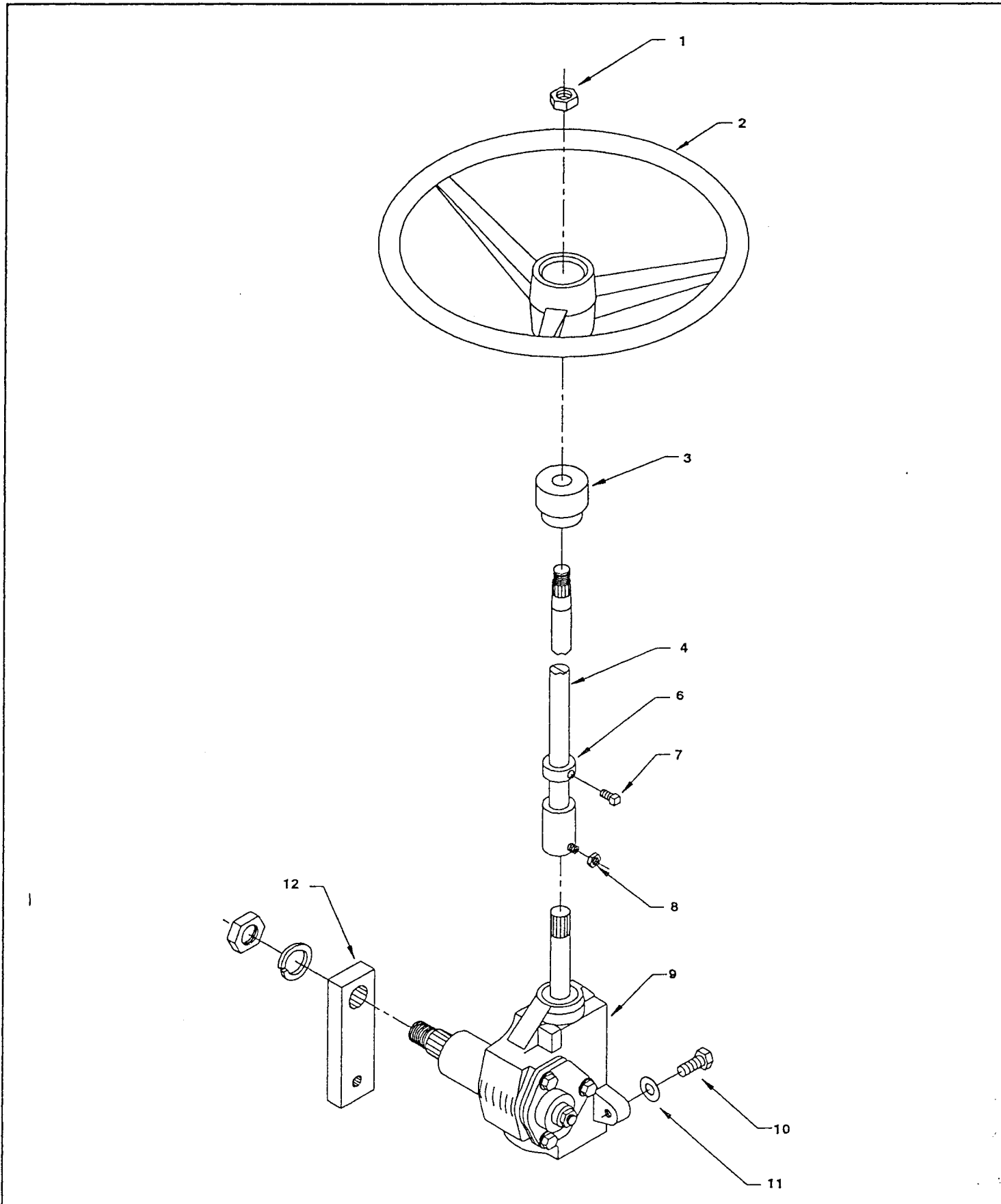
**TAYLOR-DUNN**  
Commercial and Industrial Vehicles Since 1949

ITEM #	DESCRIPTION	PART #					
		PORTABLE (Lestronic 2)					
Charger type	↑	24v25a	24v40a	36v25a	36v40a	48v25a	
Lester Model #	↑	13110	9513	7710	9475	9695	
	Charger assy.	79-301-10	79-302-10	79-305-20	79-306-20	79-309-00	
1	Ammeter	79-851-10	79-852-00	79-851-10	79-852-00	79-851-10	
2	Timer	79-805-64	79-805-64	79-805-63	79-805-63	79-805-65	
3	Capacitor	79-902-00	79-902-00	79-902-00	79-902-00	79-902-00	
4	Diode assy.	79-749-13	79-749-10	79-749-13	79-749-10	79-749-13	
5	Transformer			79-644-27			
6	Fuse	79-831-00	79-831-10	79-831-00	79-831-11	79-831-00	
7	Bushing (DC)	79-530-00	79-531-00	79-530-00	79-531-00	79-530-00	
7a	Bushing (AC)	79-530-00	79-530-00	79-530-00	79-530-00	79-530-00	
7b	Bushing (harness)	-----	-----	-----	-----	-----	
8	DC cord	79-566-10	79-567-10	79-566-10	79-567-10	79-566-10	
9	AC cord	79-575-10	79-575-10	79-575-10	79-575-10	79-575-10	
10	AC plug	76-200-00	76-200-00	76-200-00	76-200-00	76-200-00	



Typical portable charger

## B 2-38 / B 2-48 / B 2-54



# STEERING ASSEMBLY

B 2-38 / B 2-48 / B 2-54 / B 2-56

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	88-199-82	5/8 NF Hex Head Jam Nut	1
2	19-011-20	Steering Wheel, 3 Spoke, 14 Inch	1
3	32-248-10	Bushing, Steering, 3/4 I.D., 1-1/2 O.D.	1
	18-308-35	Steering Assembly ( Includes Items 4 Through 9 )	1
4	20-031-35	Steering Shaft, 24.469 Long	1
6	17-110-00	Collar, 3/4 Inch Shaft	1
7	88-087-06	5/16 x 1/2 NC Square Head Screw	1
8		5/16 x 5/8 NC Socket Set Screw w/ 5/16 NC Hex Head Jam Nut	1
9	18-308-21	Gear, Steering, Saginaw	1
10	18-120 15	7/16 x 1-1/2 NC Hex Head Cap Screw	1
11	88-128-62	7/16 Lock Washer	1
12	18-104-00	Pitman Arm ( Splined Steering Lever)	1