

**OPERATION  
AND  
MAINTENANCE  
MANUAL  
WITH  
PARTS LIST**

**MODEL: R 3-80**

**SERIAL NUMBER: 83656 - 89864**

**YEAR: 1986 - 1988**

**MANUAL NUMBER: MR-380-22**

**- IMPORTANT -**

READ AND FOLLOW INSTRUCTIONS GIVEN  
IN SAFETY & OPERATIONS 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. ANSI B56.8 applies to only those vehicles with serial numbers dated after July 31, 1982.

Definition of the three terms are as follows:

**▲ WARNING** - There is a potential for injury to yourself and 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 3 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 making a turn.
6. Drive slowly straight up and down inclines.
7. Set parking brake before leaving vehicle.
8. Forward/Reverse switch 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.

TABLE OF CONTENTS  
R 3-80

CONTENTS	SECTION
INSPECTION, SAFETY AND INTRODUCTION	1
WARRANTY	2
OPERATING RESPONSIBILITIES AND MAINTENANC PRACTICES	3
MAINTENANCE GUIDE CHECKLIST	4
LUBRICATION DIAGRAM, TIRE CHART AND STEERING ADJUSTMENT	5
WIRING DIAGRAM	6
TROUBLE SHOOTING LIST	7
BATTERIES	8
CHARGERS	9
MAINTENANCE PROCEDURES, SERVICE AND ADJUSTMENTS PARTS ILLUSTRATIONS AND LISTINGS	
FRONT AXLE, STEERING AND TIRES	10
STEERING WORM ASSEMBLY	10
BELT DRIVE, REAR AXLE AND POWER TRACTION	11
BRAKE SYSTEM	12
DC MOTOR	13
CONTROL LINKAGE	14
PWR-TRON SPEED CONTROL	15
RHEOSTAT SPEED CONTROL	16
BODY, SEATS, DECKBOARDS, TRIM AND OPTIONAL ITEMS	17
RECOMMENDED SPARE PARTS AND ORDERING PROCEDURE	18

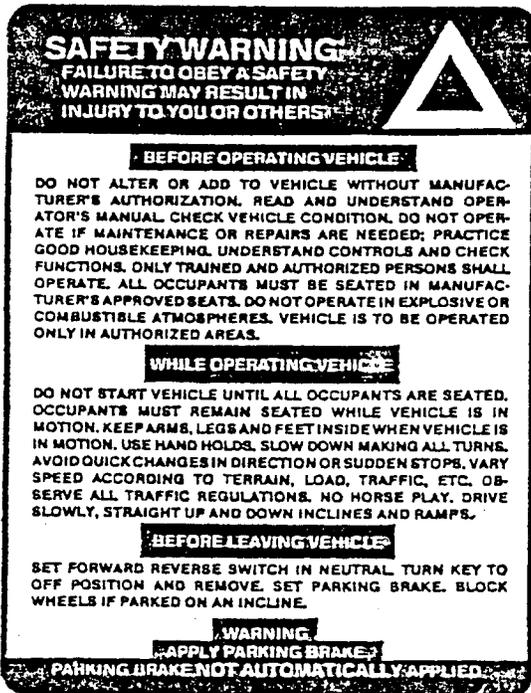
INSPECTION, SAFETY AND INTRODUCTION  
ARRIVAL INSPECTION CHECKLIST

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 tightness.
- F. If vehicle is equipped with hydraulic brakes, check hydraulic lines for evidence of damage.
- G. Check brake fluid level in master cylinder, if hydraulic brakes.
- 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 a thorough review of Sections 1, 2 and 3.



**WARNING**

BATTERY GASES CAN BE EXPLOSIVE.  
KEEP SPARKS, FLAMES AND LIGHTED CIGARETTES AWAY FROM BATTERY. DANGER IS INCREASED WHILE CHARGING. IF CHARGING WHILE BATTERIES ARE IN VEHICLE, VEHICLE MUST BE IN A WELL VENTILATED AREA.



**WARNING DECAL**  
Indicates the possibility of immediate danger and must not be ignored.  
94-313-00



**SAFETY WARNING DECAL**

94-313-20

This decal is located on the front cowl. All information is for your safety, occupants and those around you. This decal and all others must remain in the vehicle.

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 to be aware of the vehicle operating characteristics and safety recommendations of the manufacturer, to assist them in exercising the judgement necessary to prevent injury to themselves or to others.

IMPORTANT: 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 their service and maintenance processes, to assist them in applying sensible judgement to those processes.

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

CAUTION: 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 down hill. If this is allowed to occur, vehicle stability and braking performance become unpredictable. ▲ WARNING: DO NOT exceed, under any circumstances, the maximum design speed of the vehicle.

CONTROLS: Bring the vehicle to a complete stand still before operating the forward/reverse switch to change direction of travel. DO NOT use the accelerator to hold the vehicle at a standstill on an incline. Use only the brakes to hold the vehicle at rest while on a hill. ▲ WARNING: intentional/unintentional mis-use of controls could result in an accident.

BRAKES (MECHANICAL DISC): 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.

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 Sections 3 and 4.

CAUTION: 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 the motor circuit is closed, intentionally or otherwise. Whenever practical disconnect battery leads to avoid unintentional starting of the motor during servicing or maintenance.

SAFETY continued

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 in Section 7.

WARNING:

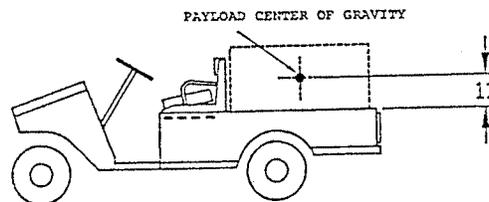
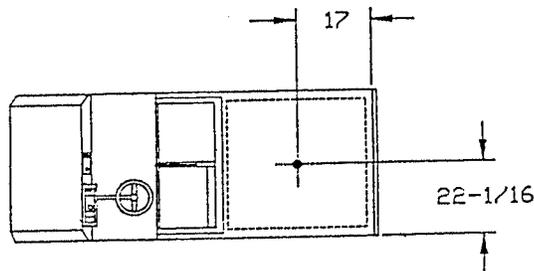
1. When performing maintenance on any part of the vehicle electrical system, disconnect main battery leads, place forward/reverse switch in neutral. Remove key from keylock in dash panel.
2. Never replace a circuit fuse with one having a higher rating than the original equipment fuse. Fuses have been 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.

INTRODUCTION

This vehicle is designed to be driven on smooth surfaces in and around industrial plants, nurseries, institutions, motels, mobile home parks and resorts. It is not designed to be driven on the public highways. It is not designed to go in excess of 15 mph on level surfaces or downhill. Speeds in excess of this may result in steering difficulty and possible loss of vehicle control. Vehicle is not designed to be towed in excess of 15 mph.

SERIAL NO.

The model number and serial number are on a metal plate attached to the cowl panel right hand side. In ordering parts or referring to your unit, please use these numbers. Replacement parts can be purchased directly from your local authorized dealer. This manual is effective for R 3-80 beginning with serial number 83656.



## TAYLOR-DUNN LIMITED 90 DAY WARRANTY

TAYLOR-DUNN MANUFACTURING COMPANY (TDMC), warrants each new Taylor-Dunn vehicle for ninety (90) days according to the following terms:

This warranty provides coverage for the original retail purchaser only and becomes effective on the date of the original retail purchase.

Any part of the Taylor-Dunn vehicle manufactured or supplied by TDMC and found in the reasonable judgment of TDMC to be defective in material or workmanship will be repaired and/or replaced at the business location of an authorized Taylor-Dunn distributor only without charge for parts and labor. The Taylor-Dunn vehicle (including any defective part) must be delivered to an authorized Taylor-Dunn distributor within the warranty period.

All costs of a service call regarding warranty-related repairs and/or replacements on the Taylor-Dunn vehicle at the owner's location, the labor performed by the distributor at the owner's location, all costs of delivering the Taylor-Dunn vehicle to the distributor for warranty work and the costs of returning the Taylor-Dunn vehicle back to the owner after repair or replacement will be paid for by the owner. Proof of purchase will be required by the authorized Taylor-Dunn distributor to substantiate any warranty claim. All warranty work must be performed by an authorized Taylor-Dunn distributor.

TDMC does not provide a warranty related to SCR's, tires, batteries, chargers, or other parts not of their manufacture as such parts are usually warranted separately by their respective manufacturers.

This warranty does not include service items subject to normal wear such as brake linings, seals, belts, light bulbs and fuses.

This warranty does not provide coverage for any Taylor-Dunn vehicle that has been subject to misuse, neglect, negligence, accident, or operated in any way contrary to the operating or maintenance instructions as specified in the TDMC operator's manual. The warranty does not apply to any Taylor-Dunn vehicle that has been altered or modified so as to adversely affect the vehicle's operation, performance or durability or that has been altered or modified so as to change its intended use. In addition, the warranty does not extend to repairs made necessary by normal wear, or by the use of parts or accessories which in the reasonable judgment of TDMC are either incompatible with the Taylor-Dunn vehicle or adversely affect its operation, performance or durability.

Repairs or replacements qualifying under this warranty will be performed by an authorized Taylor-Dunn distributor following delivery of the vehicle to the distributor's place of business. TDMC's responsibility in respect to claims is limited to making the required repairs or replacements. No claim of breach of warranty shall be cause for cancellation of the contract of sale of any Taylor-Dunn vehicle.

TDMC assumes no liability or responsibility for loss of use of the Taylor-Dunn vehicle, loss of time, inconvenience, or other damage, consequential or otherwise, including, but not limited to, all costs for delivering the Taylor-Dunn vehicle to the distributor and all costs of returning the vehicle back to the owner, mechanic's travel time, telephone or telegram charges, trailering or towing charges, rental of a like vehicle during the time warranty repairs are being performed, travel, lodging, loss or damage to personal property, or loss of revenue.

TDMC reserves the right to change or improve the design of any vehicle without assuming any obligation to modify any TDMC vehicle previously manufactured.

All implied warranties are limited in duration to the ninety (90) day warranty period. Accordingly, any such implied warranties

including merchantability, fitness for a particular purpose, or otherwise, are disclaimed in their entirety after the expiration of the ninety (90) day warranty period. TDMC's obligation under this warranty is absolutely and exclusively limited to the repair or replacement of defective parts, and TDMC does not assume, or does not authorize anyone to assume for them, any other obligation.

This warranty applies to all TDMC vehicles sold in the United States.

### WARRANTY SERVICE

To make a claim under warranty, contact an authorized Taylor-Dunn distributor immediately upon realizing a problem exists. We recommend having the warranty work performed by the distributor who originally sold you the vehicle; however, warranty work can be obtained from any authorized Taylor-Dunn distributor. Remember, your Taylor-Dunn vehicle must be delivered to an authorized distributor within the warranty period, and all warranty work must be performed only by an authorized Taylor-Dunn distributor. Your proof of purchase will be required by the dealer to verify any warranty claim.

### Examples of Items Not Covered by Warranty

Provisions of the warranty will not apply to:

Normal service requirements occurring during the warranty period, such as adjustment and cleaning or wear of a drive belt, drive chain, brake or rheostat.

Normal service work over and above the repair and replacement of defective parts. Vehicles subject to misuse, neglect, negligence, or accident.

Vehicles that have been altered or modified so as to adversely affect their operation, performance or durability or to change their intended use.

Repairs made necessary by the use of parts or accessories which are either incompatible with the vehicle or adversely affect its operation, performance or durability.

Vehicles not operated or maintained in accordance with the instructions in the Taylor-Dunn Operator's Manual.

Periodic checking, lubricating the vehicle or service check-up.

All costs of delivering the vehicle to the distributor and all costs of returning the vehicle back to the owner, mechanic's travel time, trailering or towing charges, or rental of a like vehicle during the time warranty repairs are being performed.

This warranty applies only to the original retail purchaser. Second-owner or subsequently owned vehicles are not covered under the warranty.

### Owner's Obligation and Responsibility

Normal maintenance service and replacement of service items are the responsibility of the owner and as such are not considered defects in material or workmanship with the terms of this warranty. Individual operating habits and usage may contribute extensively to the need for maintenance service.

Consult with your authorized Taylor-Dunn distributor for advice on proper maintenance and care of your vehicle. Proper maintenance and care will be very helpful in keeping your over-all operating costs at a minimum.

To assure warranty coverage, it is the owner's responsibility to maintain all components in proper adjustment and to service the vehicle as specified in the Taylor-Dunn Vehicle Operator's Manual. It is the owner's responsibility to provide proper lubrication for all components and provide correct recommended battery maintenance, to maintain the battery liquid level and charge as specified, as well as maintain the correct pressure in the tires of the vehicle.

## 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. Read the following instructions and with power OFF, operate each control.

### STEERING

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

### KEY LOCK

Your vehicle is equipped with a keyed lock located on the instrument 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.

### AUTOMATIC DEADMAN SEAT SWITCH

This system is standard on your vehicle and acts as a safety feature when operator arises from seat. Seat will rise and disconnect battery/motor circuit.

### SERVICE BRAKE (FOOT)

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

### PARK BRAKE

This is a hand brake located next to the driver's seat. Take firm grip with right hand, depressing handle button and pull up. Release by depressing button and push down.

### FORWARD/REVERSE SWITCH

The forward/reverse switch is located on the instrument panel. It is a rocker type switch. Depressing the upper part places the vehicle in forward. Depressing the lower portion full downward places vehicle in reverse. Center position is off. **CAUTION:** The forward/reverse switch serves the same purpose as the transmission SELECTOR in your automobile. Treat it with the same respect and care. DO NOT SHIFT from forward to reverse or vice-versa while the vehicle is in motion.

### ACCELERATOR SWITCH

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 fully 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 on the floor board to the left of the steering column. Depressing button sounds horn. Releasing button will immediately silence horn.

### CHARGE INDICATOR:

Located on instrument panel. Shows condition of batteries at all times.

OPERATING INSTRUCTIONS continued

BATTERY CHARGER

Refer to Section 8 for proper instructions to operate your battery charger.

STANDARD OPTIONAL ACCESSORIES

WINDSHIELD WIPER

On vehicles equipped with electric windshield wipers use the Accessory (ACC) Control Switch.

DIRECTION SIGNALS

On vehicles equipped with directional turn signals the control is located on the steering column. Move the control lever in the direction you will be turning your steering wheel to signal the direction you intend to turn your vehicle. Indicating lamps are located within the turn signal control for your convenience.

The directional turn signal also serves as an emergency flasher control by pulling the control lever outward away from steering column when in neutral position.

HEADLIGHT (IF SO EQUIPPED) AND DUAL TAILLIGHTS

Use instrument panel switch labeled, "HEADLIGHT"

MAJOR OPTIONS (SEE SECTION 16)

CAB

An all metal cab with or without metal doors

TOOL BOX

Mounts two metal doors to rear compartment

FOLD DOWN REAR SEAT

Folds into rear deck when not in use

CARGO BOX

All metal with rear doors.

NOTE: Other items are also shown in Section 16 for kit up-dating of basic vehicles.

OPERATING YOUR VEHICLE

To put your vehicle into operation; sit on seat, turn key on (clockwise). Select direction you wish to travel by activating forward reverse switch then 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.

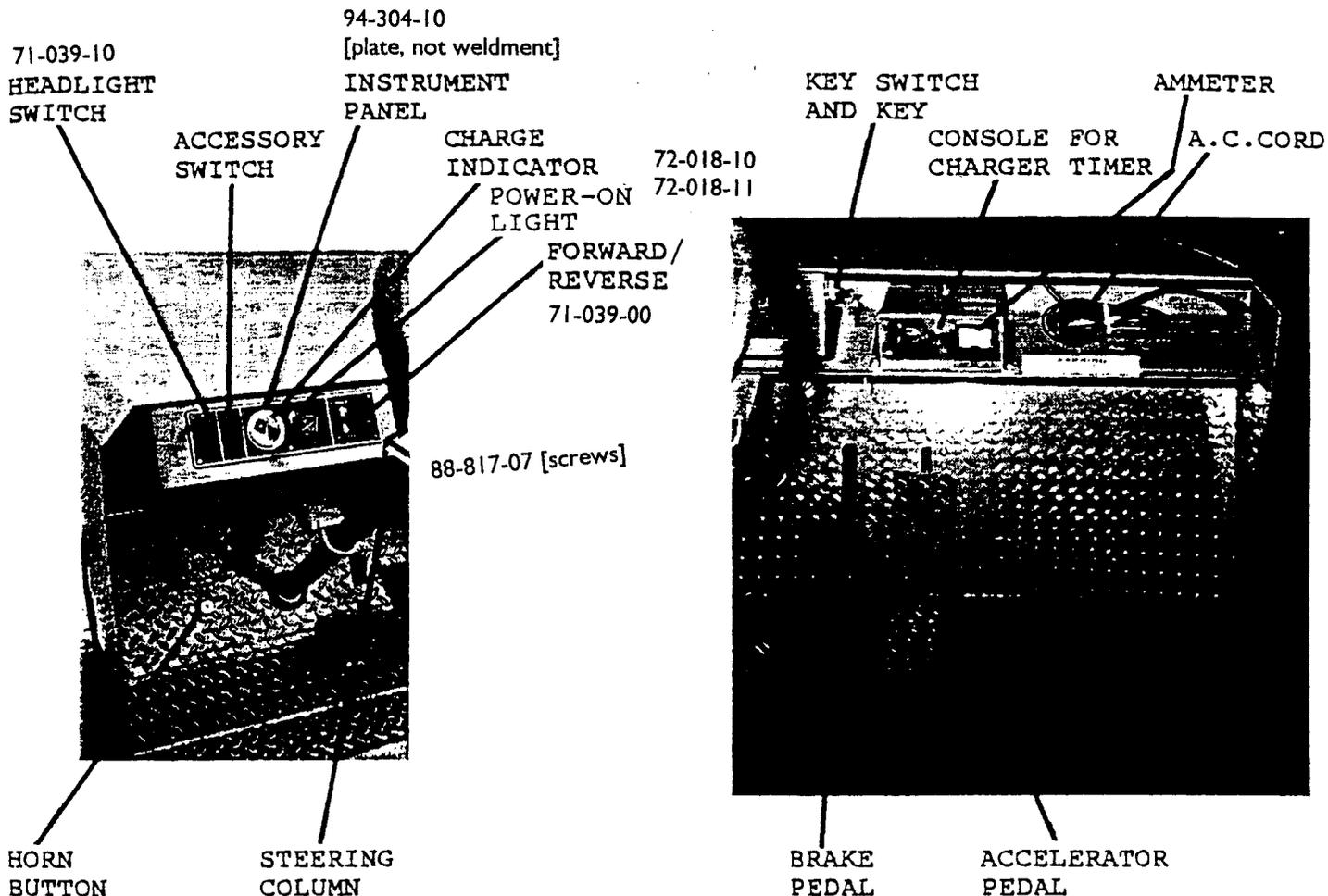
CAUTION:

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 YOUR FOOT BRAKE TO HOLD THE VEHICLE ON A HILL SAFELY.

WARNING:

WHEN YOU LEAVE YOUR VEHICLE, SET HAND BRAKE, PLACE FORWARD/REVERSE SWITCH IN NEUTRAL POSITION AND REMOVE KEY.

DRIVE SAFELY AND ENJOY YOUR TAYLOR-DUNN VEHICLE



OPERATING RESPONSIBILITIES  
AMERICAN NATIONAL STANDARD PERSONNEL AND BURDEN CARRIERS  
ANSI B 56.8-1981  
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 employee 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 by any operator.

(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:

OPERATING RESPONSIBILITIES continued  
ANSI B56.8-1981

(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.

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

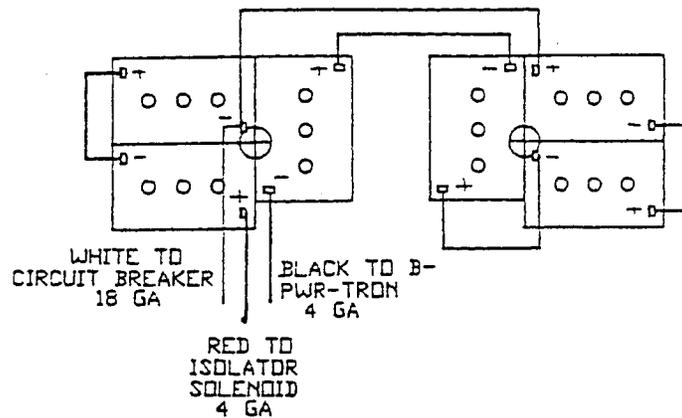
(i) Fire aisles, access to stairways, and fire equipment shall be kept clear.

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

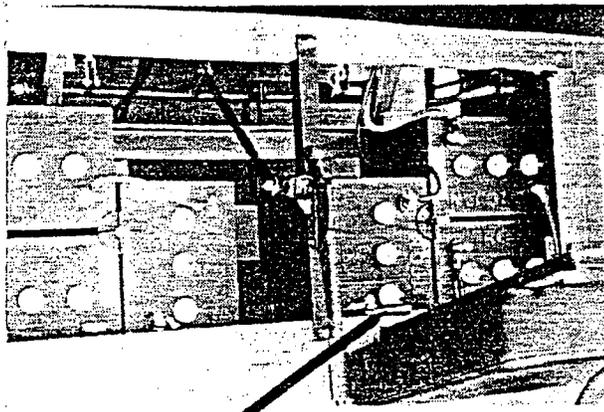
505 TRAVELING

(a) Observe all traffic regulations, including authorized plant speed limit. 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.

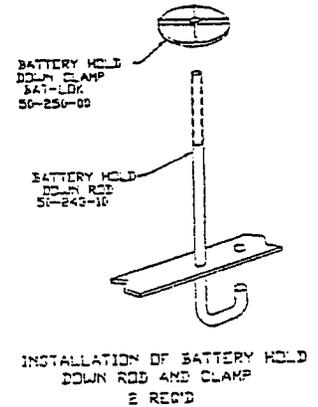
(b) Yield the right of way to pedestrians, ambulances, fire trucks, or other carriers or vehicles in emergency situations.



BATTERY WIRING



71-135-01



BATTERY COMPARTMENT  
SHOWING DEADMAN SEAT  
MECHANISM UNDER DRIVER'S SEAT

BATTERIES

PART NO.	DESCRIPTION	QTY.
50-243-10	Rod, Battery Hold Down	2
50-250-00	BAT LOK, (Battery Hold Down Clamp)	2
75-231-00	Battery Jumper #6 Wire, 10-1/4" Long	3
75-234-00	Battery Jumper #6 Wire, 18-1/4" Long	3
71-135-01	Micro Switch, Type Z, 5/16 x 2-1/2 Blade	1
77-031-00	6 Volt, 190 A. H. Battery (Standard)	6
77-042-00	6 Volt, 217 A. H. Battery	6
74-009-00	Charge Indicator, 36 Volt (Not Shown)	1
77-047-00	6 Volt, 244 A. H. Battery	6
77-048-00	6 Volt, 250 A. H. Battery	6
77-200-00	Hydrometer (Not Shown)	1
77-201-00	Battery Filler (Not Shown)	1

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, 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 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) 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 operating position.

2) Depress clutch (or brake pedal on automatic transmission 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 gauges, may dangerously weaken the tank and make it unsafe for use.

(n) Brakes, steering mechanisms, control mechanism, 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.

MAINTENANCE PRACTICES continued  
ANSI B56.8-1981

602 MAINTENANCE PROCEDURES continued

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

(s) 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 written authorization; where authorized modifications 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 original equipment.

 W A R N I N G

When replacement parts are necessary, use Taylor-Dunn parts to insure original strength and characteristics.

MAINTENANCE GUIDE CHECKLIST

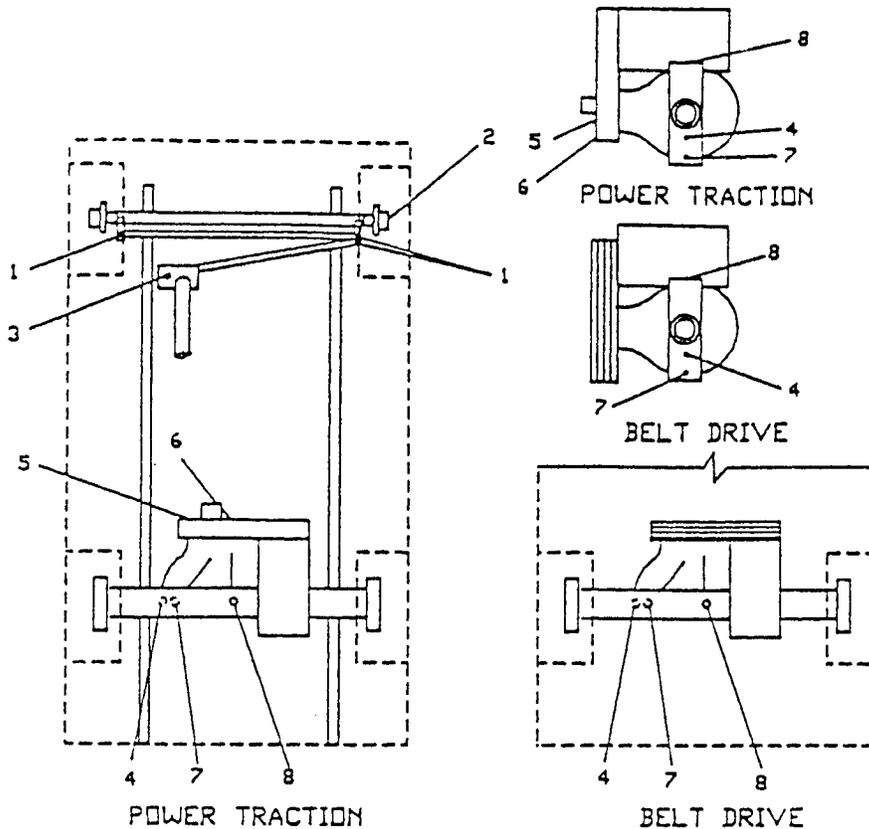
This checklist is provided for your convenience as a guide for servicing your vehicle. If followed you will enjoy a good running and trouble free unit. It has been set up for average normal use. More frequent service is recommended for extreme or heavy usage. If desired your Taylor-Dunn dealer will gladly perform these service 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.

**⚠ WARNING:** When performing maintenance on any part of the electrical system, turn key to off position and remove from switch, disconnect main battery leads and place Forward/Reverse switch in neutral.

MAINTENANCE	EVERY WEEK	EVERY MONTH	EVERY 3 MONTHS	EVERY YEAR
Check and fill batteries. If necessary fill with distilled water only.	X	X	X	X
Check tire pressure.	X	X	X	X
Adjust Motor Mount & Chain (Refer to chart Section 10)				
Lubricate all Zerk Fittings.			X	X
Lubricate all moving parts without Zerk Fittings. Use all purpose engine oil.			X	X
Wash off batteries with water, (use soda if necessary).			X	X
Check all wire connections. Be sure they are all clean and tight.			X	X
Check deadman seat and foot operated brake systems.		X	X	X
Check hydraulic brake system for leaks also check brake fluid level in master cylinder.			X	X
Check disc brake pad linings for wear. Adjust as necessary.			X	X
Check rear axle differential oil level (refer to lubrication diagram).				X
Check drive axle oil level (refer to lubrication diagram).				X
* Lubricate front wheel bearings (2 Zerk fittings)				X
Drain differential and refill with SAE 30 oil (refer to lubrication diagram)				
Repack front wheel bearings (use wheel bearing grease).				X
Lubricate steering gear box with 90# grease.				X
* Check and adjust front wheel bearings.			X	X

\* ITEMS RELATED TO SAFETY RECOMMENDATIONS

R 3-80 LUBRICATION DIAGRAM



- A. PRESSURE GUM NO. GREASE PLCS FREQ.**
- 1. BALL JOINTS 3 3 MOS.
  - 2. FRONT WHL HUB 2 3 MOS.
  - 3. STEERING GEAR BOX 1 1 YR
- B. POWDERED GRAPHITE**
- KEY LOCK 1 1 YR
- C. SAE 30 OIL**
- AXLE & DIFFERENTIAL
- 4. LEVEL CHECK 1 \*\* 3 YR
- OIL CHANGE-POWER TRACTION**
- a. REMOVE DRAIN PLUGS 6 & 7 LEVEL PLUGS 4 & 5. FILL PLUG 8
  - b. DRAIN OIL. REPLACE 6 & 7
  - c. ADD OIL BY 8 TO LEVEL OF 4
  - d. ADD OIL BY 5, 1/2" BELOW 5
  - e. REPLACE 4, 5 & 8
- OIL CHANGE-BELT DRIVE**
- a. REMOVE DRAIN PLUG 7 LEVEL PLUG 4 FILL PLUG 8
  - b. DRAIN OIL, REPLACE 7
  - c. ADD OIL BY 8 TO LEVEL OF 4
  - d. REPLACE 4 & 8
- ITEMS RELATED TO SAFETY  
\*\* CHECK LEVEL WHENEVER LEAKAGE IS EVIDENT

R 3-80 LUBRICATION DWG.

TIRE CARE:

Tire pressure is governed by how you want your vehicle to ride and the terrain to which it is most commonly used upon.

Slightly lower pressure will assist traction of soft terrain without undue wear.

The chart listed below will assist you to determine the correct tire pressure for your needs.

TIRE INFLATION CHART							
TIRE SIZE	TYPE	TIRE LOAD RATING		MAXIMUM (COLD) INFLATION P.S.I.	5 MPH	10 MPH	15 MPH
		RANGE	RATING		LOAD POUNDS	LOAD POUNDS	LOAD POUNDS
4.80-8/400-8	HIGHWAY TREAD	A	2	35	640	505	470
4.80-8/400-8	HIGHWAY TREAD	B	4	70	960	760	710
4.80-8/400-8	STEELGUARD	C	6	100	1220	960	895
5.70-8/500-8	HIGHWAY TREAD	B	4	60	1240	980	915
5.70-8/500-8	HIGHWAY TREAD	C	6	90	1520	1240	1160
5.70-8/500-8	STEELGUARD	D	8	100	1860	1470	1370
16 X 6.50 X 8	TERRA TIRE	B	4	28		620	
18 X 8.50 X 8	TERRA TIRE	B	4	22		815	
18 X 9.50 X 8	TERRA TIRE	B	4	24		1040	

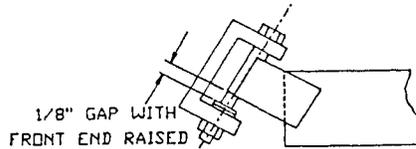
THE INFLATION AND LOAD RATINGS MOLDED ON HIGHWAY TREAD TIRES, PER FEDERAL STANDARD FMVSS-119, ARE FOR MAXIMUM HIGHWAY SPEED AND DO NOT APPLY TO THIS LOW SPEED VEHICLE.

- TAYLOR-DUNN MANUFACTURING COMPANY -

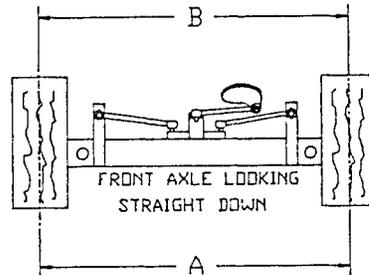
**CAUTION:** Do not over-inflate tires as this will promote increased wear. Under inflation especially on hard surfaces also promotes undue wear and should be avoided.

STEERING ADJUSTMENT

1. Raise vehicle front end in the air. Inspect kingpin at each end of the axle for 1/8 inch gap. Adjust the kingpin so 1/8 inch gap exists, if necessary.

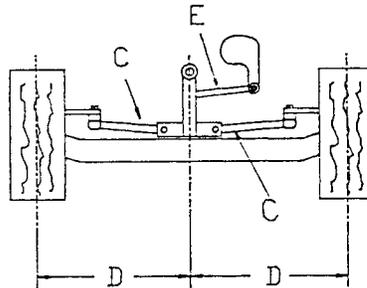


2. Adjust connecting arm on front axle for proper toe-in of 0 to 1/8 inches.



Dimension A = B or A should be 1/8 inch less.

3. Adjust steering sleeves (C) so wheels are straight and ball joint centered on vehicle; dimension D = D. E should be 8-1/8 inches (verify) center/center.



4. Return vehicle to ground for turning load. Center steering mechanism by turning steering wheel full clockwise. Counting number of full turns, turn steering wheel full counter clockwise. Counting half the number of full turns return steering wheel to center. Install 18-040-11 (E) adjust so steering wheel is stopped by internal gear box stops in both directions of wheel turn.
5. Straighten wheels.
6. Loosen steering wheel and center on steering column. Tighten steering wheel. Steering adjustment is complete.

R 3-80 WIRING DIAGRAM

THERE ARE TWO BASIC WIRING DIAGRAMS:

1. The PWR-TRON II wiring found in Section 15 for those vehicles with a PWR-TRON II system.

and

2. The Rheostat Speed Controller wiring diagram found in Section 16 for those vehicles with a rheostat system.

TROUBLE SHOOTING PROCEDURES

<u>SYMPTOM</u>	<u>PROBABLE CAUSE</u>	<u>CORRECTIVE ACTION</u>
1. <u>STEERING</u>		
a. Pull in one direction	<ol style="list-style-type: none"> <li>1. Unbalanced front tire pressure</li> <li>2. Bent or maladjusted tie rod</li> <li>3. Bent axle or spindle</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and adjust pressures</li> <li>2. Repair, replace or adjust tie rod</li> <li>3. Repair or replace</li> </ol>
b. Hard Steering	<ol style="list-style-type: none"> <li>1. Low tire pressure</li> <li>2. Dry pivot points in steering linkage</li> <li>3. Bent or maladjusted king pin</li> </ol>	<ol style="list-style-type: none"> <li>1. Inflate to 50 lbs.</li> <li>2. Lubricate - See Section 2</li> <li>3. Repair, replace or adjust king pin</li> </ol>
c. Sloppy or Loose	<ol style="list-style-type: none"> <li>1. Loose wheel bearing</li> <li>2. Loose or worn ball joints</li> <li>3. Worn king pin bushings or king pins</li> <li>4. Excess backlash in steering gear box</li> <li>5. Worn idler arm bushings</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust</li> <li>2. Tighten or replace ball joints Sec. 11</li> <li>3. Replace bushings or pins and bushings</li> <li>4. Adjust backlash</li> <li>5. Replace arm and bushings</li> </ol>
2. <u>DRIVE AXLE</u>		
a. Erratic Operation	<ol style="list-style-type: none"> <li>1. Faulty power system</li> <li>2. Badly worn drive sprockets or belts</li> </ol>	<ol style="list-style-type: none"> <li>1. See Section 13</li> <li>2. Replace sprockets or belts</li> </ol>
b. Lack of Power Slow Operating	<ol style="list-style-type: none"> <li>1. Faulty power system</li> <li>2. (belt drive only) Belt slipping or missing</li> <li>3. Parking brake not completely released</li> <li>4. Incorrect brake adjustment brake dragging</li> <li>5. Defective or maladjusted wheel bearing</li> <li>6. Bind or drag in primary drive or differential</li> </ol>	<ol style="list-style-type: none"> <li>1. See Section 13</li> <li>2. Adjust belt tension or replace belts</li> <li>3. Release parking brake</li> <li>4. Adjust brake system</li> <li>5. Adjust or replace bearing</li> <li>6. Check and repair primary drive or differential</li> </ol>
c. Abnormal Noise in drive train	<ol style="list-style-type: none"> <li>1. Defective motor bearing</li> <li>2. Loose motor mount</li> <li>3. Worn or broken sprockets or pulleys</li> <li>4. Worn gears or bearings in differential</li> <li>5. Defective axle bearing</li> <li>6. Worn or bent axle</li> <li>7. Loose wheel lug nuts</li> <li>8. Defective spring eye bushings</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace motor bearing</li> <li>2. Tighten motor mount</li> <li>3. Replace sprockets or pulleys</li> <li>4. Check and replace gears or bearings</li> <li>5. Replace bearing</li> <li>6. Replace axle</li> <li>7. Tighten lug nuts</li> <li>8. Replace bushings</li> </ol>

2. DRIVE AXLE continued

d. Oil leaks in wheel bearing area

1. Wheel bearing seal defective
2. Wheel bearing gasket defective
3. Axle retainer plate not tightened
4. Drive axle filled above proper level

1. Replace seal
2. Replace gasket
3. Tighten axle retainer plate
4. Drain oil to proper level

e. Oil leaks in gear case or motor area

1. Defective gear case cover gasket
2. Motor mount "O" ring defective or missing
3. Defective motor bearing oil seal

1. Replace gasket
2. Install "O" ring seal
3. Replace oil seal

3. BRAKES

a. Poor brakes

1. Worn disc brake pads
2. Brake lining wet or oily
3. Bind in brake linkage
4. Incorrect linkage adjustment

1. Adjust for lining wear or replace if less than .020 thick
2. Clean and dry or replace if oily
3. Loosen and readjust brake linkage
4. Adjust linkage

b. No brakes:  
Pedal reaches the floor board

1. Incorrect linkage adjustment
2. Broken linkage

1. Adjust linkage
2. Repair or replace broken part

c. Excessive or grabbing brakes

1. Small amount of oil on lining
2. Scored or rough brake disc rotor
3. Incorrect linkage adjustment

1. Clean lining
2. Replace disc rotor (axle weldment)
3. Adjust linkage

4. POWER SYSTEM

a. No power to motor in forward or reverse

1. Batteries discharged or defective
2. Forward-reverse switch maladjusted or worn
3. Motor brushes not contacting armature
4. Loose or broken wire
5. Motor defective

1. Recharge or replace batteries
2. Adjust or repair forward-reverse contacts
3. Adjust or replace
4. Tighten or replace wire
5. Repair or replace motor

b. Erratic Operation

1. Batteries discharged
2. Forward-reverse switch maladjusted or worn
3. Loose wire or wires
4. Motor brushes worn

1. Recharge batteries
2. Adjust or repair forward -reverse contacts
3. Tighten
4. Replace brushes

SECTION 7  
Page 3

4. POWER SYSTEM continued

c. Vehicle range

1. Batteries not fully charged
2. Batteries nearing end of normal life
3. Charger output not sufficient
4. Charger defective

d. No power in one direction and full power in other direction without depressing accelerator

1. Switching and motor circuit not properly connected

e. Poor performance excessive heat

1. Driving with park brake on

SECTION 7  
Page 3

1. Recharge batteries  
Review charging practice
2. Replace batteries
3. Adjust transformer taps
4. Repair or replace charger
1. Correct power conduit wiring to diagram, Section 15, Page 6

1. Fix or install foot park brake interlock

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 7-1/2 years, or 1800 cycles, with appropriate use and care.

It cannot be over emphasized how important good maintenance procedures and normal 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 9, 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 overfilling. However, the water level should cover the plates prior to charging.

MAINTENANCE PROCEDURES, BATTERIES continued

4. CLEANING

Batteries pick up various kinds of dirt and dust, depending on their surroundings and to the type of service they are subjected. This is usually dry dirt, which can be 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 degrees below zero. Yet a battery in a very low state of charge may freeze at temperatures around 10 to 15 degrees 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.

6. WINTER STORAGE

- a. Before storing your vehicles in a sheltered area for the winter season, clean and check the charge level of the batteries according to the information contained in paragraphs 4 and 5 of this section.

**CAUTION:** Before service personnel service the batteries, disconnect both main battery leads, place the forward/reverse switch in neutral, turn the key OFF and remove from switch. Set the parking brake. Service personnel should wear proper clothing and eye protection.

MAINTENANCE PROCEDURES, BATTERIES continued

6. Winter Storage continued

- b. Although not required, the following information is provided as a good maintenance practice to be followed when and where practical to perform.
1. Remove the batteries from the vehicles for cleaning.
  2. Clean batteries according to instruction in paragraph 4.
  3. Clean heavy corrosion from each battery post and cable terminal with a wire brush.
  4. Using baking soda and hot water solution, neutralize all battery acid corrosion in battery compartment. If necessary, use a wire brush on severe corrosion areas.
  5. Flush battery compartment area with fresh water and dry compartment area thoroughly.
  6. Paint or apply light film of petroleum jelly to exposed metal surfaces.
  7. After battery compartment has been properly treated reinstall batteries while taking special care to properly connect battery cables.

**DANGER:** Improper connection could cause a battery explosion and possible result in personal injury and/or damage to the vehicle.

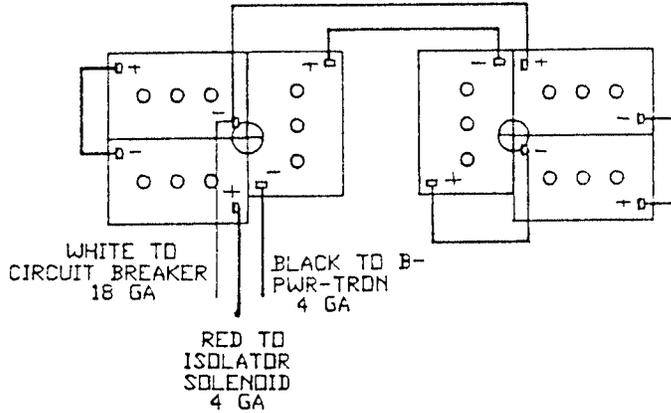
8. Check battery charge state according to information contained in paragraph 5 of this section.

BATTERY MAINTENANCE RECORD

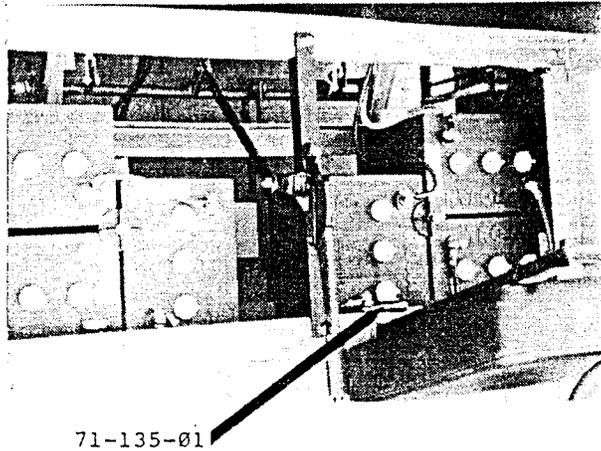
VEHICLE NO.

Battery No.	Cell No.	Date			Date			Date		
		Water	Gravity	Gravity	Water	Gravity	Gravity	Water	Gravity	Gravity
		OK or Low	Before Charge	After Charge	OK or Low	Before Charge	After Charge	OK or Low	Before Charge	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									

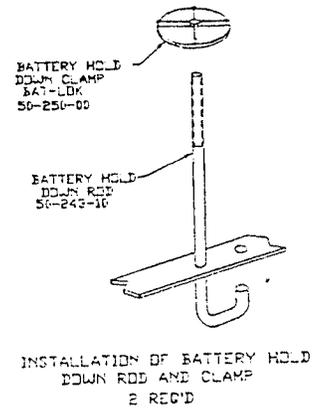
1. CAUTION: Batteries emit explosive gases. During normal operation the concentration of these gases is rarely sufficient to be considered dangerous unless flame or sparks occur in the battery compartment close to the vent holes in the battery caps. It is important that this not be allowed to occur at 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 more frequent) record as shown in 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.



BATTERY WIRING



BATTERY COMPARTMENT  
SHOWING DEADMAN SEAT  
MECHANISM UNDER DRIVER'S SEAT



BATTERIES

PART NO.	DESCRIPTION	QTY.
50-243-10	Rod, Battery Hold Down	2
50-250-00	BAT LOK, (Battery Hold Down Clamp)	2
75-231-00	Battery Jumper #6 Wire, 10-1/4" Long	3
75-234-00	Battery Jumper #6 Wire, 18-1/4" Long	3
71-135-01	Micro Switch, Type Z, 5/16 x 2-1/2 Blade	1
77-031-00	6 Volt, 190 A. H. Battery (Standard)	6
77-042-00	6 Volt, 217 A. H. Battery	6
74-009-00	Charge Indicator, 36 Volt (Not Shown)	1
77-047-00	6 Volt, 244 A. H. Battery	6
77-048-00	6 Volt, 250 A. H. Battery	6
77-200-00	Hydrometer (Not Shown)	1
77-201-00	Battery Filler (Not Shown)	1

CHARGER MAINTENANCE, SERVICE AND ADJUSTMENT

TAYLOR-DUNN / LESTER-MATIC  
BATTERY CHARGER

Line voltage compensation is achieved by flux oscillator circuit applied to battery chargers by Lester in 1962 for high reliability "Minute Man" missile standby applications. Compensates automatically for AC supply voltage variations 115-128 volts. Supply voltage variation  $\pm 10\%$  from 117 volts  $\approx \pm 1\%$  maximum battery voltage variation, decreasing to  $\pm 1/2\%$  at finish rate with constant electrolyte temperature. No taps or rate controls to set.

Automatic taper of charge rate for superior battery life through good equalization of cells and low water use rate.

Silicon diodes with inherent surge protection operated at a conservative percentage of their rating.

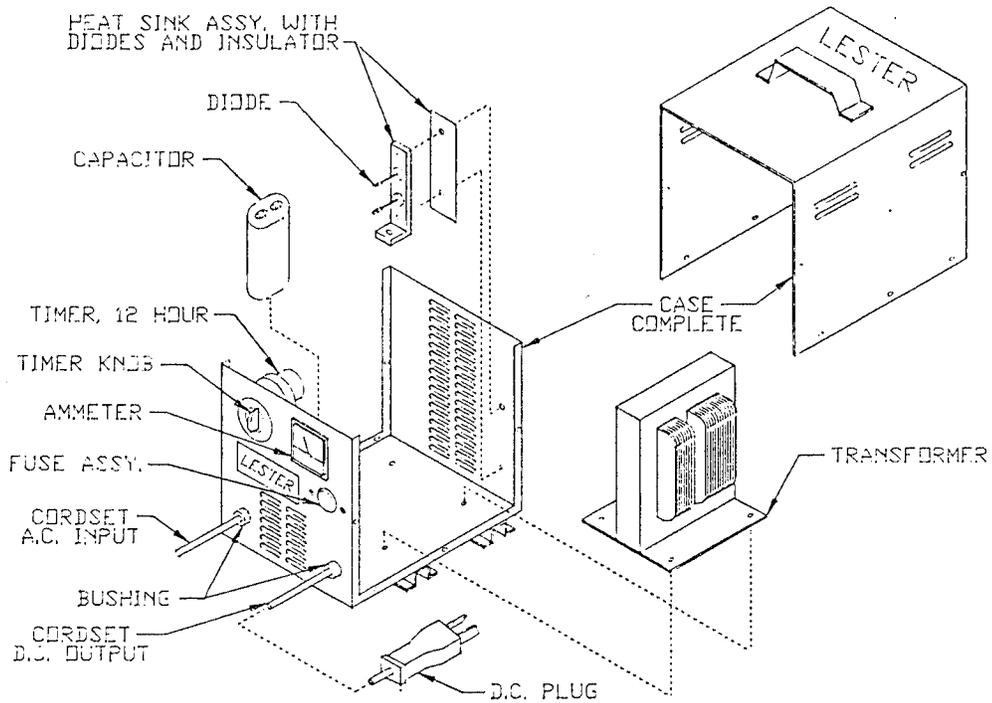
Convection cooled design for maximum reliability and minimum maintenance.

LESTRONIC II BATTERY CHARGERS

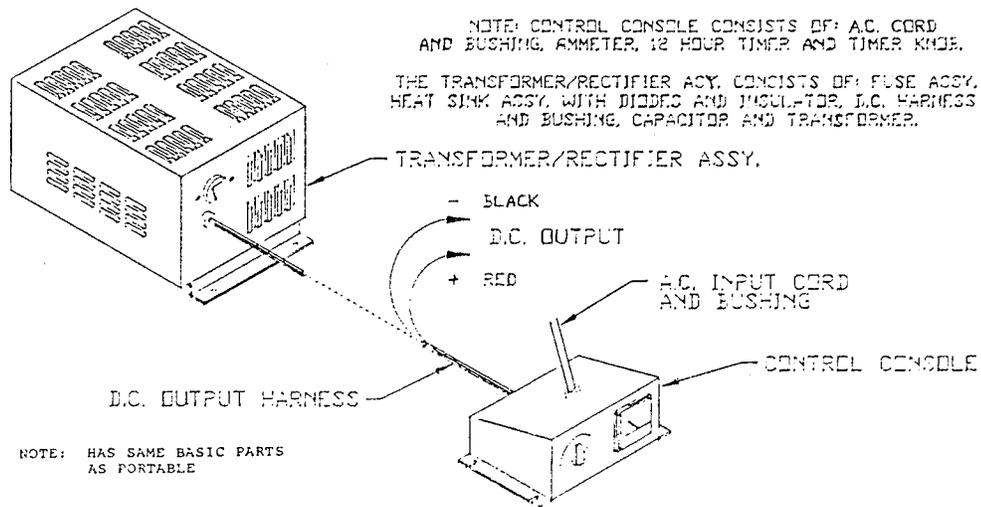
The all new automatic Lestronic chargers eliminate over and undercharging for new, old or defective batteries, whether hot or cold. Precise charging is achieved by patented Electronic Timer, utilizing state of the art integrated circuits.

Charger turns on automatically by simply connecting D.C. cord to batteries. The ammeter indicates charge rate. The charge rate tapers gradually to a finish rate of 5 to 10 amps. The Electronic Timer monitors the rate of voltage change during the charge period. When this rate levels off, the charger automatically shuts off.

CHARGER COMPONENT IDENTIFICATION



PORTABLE LESTER CHARGER  
(TYPICAL) FOR COMPONENT IDENTIFICATION  
SEE PARTS LIST FOR PORTABLE CHARGERS



NOTE: HAS SAME BASIC PARTS AS PORTABLE

BUILT-IN LESTER CHARGER  
(TYPICAL) FOR COMPONENT IDENTIFICATION  
SEE PARTS LIST FOR BUILT-IN CHARGERS

OPERATION OF "LESTER MATIC" BATTERY CHARGERS

INTRODUCTION

The Lester-Matic battery charger is a highly reliable, line compensating unit. When used according to instructions, the Lester-Matic will tend to lengthen battery life with less frequent additions of water.

INITIAL INSTALLATION:

Circuit breaker or fuse protection in the AC line to which the charger is to be plugged should allow at least 15 amps per charger. When it is necessary to use an AC extension cord to the charger, use a three conductor No. 12 AWG cord with ground, and keep as short as possible. Instructions printed on the cover of the charger are for daily reference.

NORMAL OPERATION:

The state of discharge of the batteries will be slightly different every time they are put on charge, but the Lester-Matic varies automatically the initial charge rates, and taper of charge rate over the charge period. Thus momentary initial charge rate will vary from 18-30 amps, dropping quickly to a lower value, and then tapering gradually over the charge period to a finish rate of 1-4 amps (in the green shaded area of the ammeter dial) for the last 1-3 hours. When batteries are slightly discharged, the ammeter needle will be in the green shaded area for 7-8 hours, but the specific gravity will not rise to full charge until the cells have been equalized. The normal charging with the ammeter needle in the green shaded area is important to achieve equalization of all battery cells, every time the batteries are charged. Since the taper of the charging rate (in amps, as indicated by the ammeter needle) is controlled by the rising voltage of the batteries being charged, proper performance of the charger and resulting good battery life is dependent upon the following factors.

1. An Adequate AC line to handle the power required (see "Initial Installation")
2. All cells of the batteries must be good, rising to approximately 2.5 DC volts per cell while still on charge or near the end of a 12-hour charging period. When in doubt, check each cell with a single voltmeter while still on charge. If a low reading is obtained; check the low cells with a temperature corrected hydrometer. NOTE: Hydrometer float must be thoroughly clean to obtain accurate specific readings.
3. All electrical connections of the vehicle must be clean and tight.
4. Batteries should be charged just enough to bring them to full charge because overcharging is harmful. The state of charge can be tested accurately in each cell with a hydrometer or cell tester (voltmeter), but to simplify maintaining a fleet of cars, which normally require charging at least once a day, the following "CHARGING TIME CHARTS" can be used for daily charging. Set timer knob to desired charging time shown in chart. Charger shuts off automatically at end of set period.

CHARGING TIME CHART

GOLF CAR USE	CHARGING TIME
9 Holes or Less	7 Hours
18 Holes or More	12 Hours
COMMERCIAL USE	
Less than 1 Hour	7 Hours
More than 1 Hour	12 Hours

OPERATION OF "LESTER-MATIC" BATTERY CHARGERS (continued)

If a golf car is used only occasionally, it is recommended that a refresher charge be given prior to using the car.

Commercial cars, not used in golf course operation, should be charged after use each day, or as charge becomes low as indicated by hydrometer or voltmeter test.

The necessity of adding water more frequently than two or three weeks, and/or hot battery cases at the end of the charging cycle, indicates the finish rate is too high, due to one or both of the following:

1. One or more bad cells in the batteries.
2. Batteries are starting to age to a point where hours of charge should be reduced gradually to obtain prolonged battery life.

STORAGE:

Charger may be left connected to the batteries and should be turned on for the 12-hour period once a month. In extremely cold conditions it may be necessary to charge more frequently., Check with your battery manufacturer. After each charge cycle the charger should be checked to ensure that it has turned off. Severe overcharging and possible damage to the batteries could result if the charger remains on for prolonged periods of time.

CAUTION:

THIS CHARGER IS FOR USE ONLY ON BATTERY SYSTEMS OF THE TYPE AND CAPACITY SPECIFIED ON THE CHARGER NAMEPLATE. USE OTHERWISE WILL DAMAGE CHARGER AND/OR BATTERIES.

Due to the electrical characteristics of this charger, it is possible to improperly hook up batteries and not blow the fuses when charging. When installing batteries, be sure polarity is correct. With a DC voltmeter, check terminal voltage and polarity at the car receptacle.

CAUTION:

When working near capacitor terminals be sure charger is turned off. With charger "on" transformer capacitor voltage is approximately 640 volts. Use care. Before performing service, disconnect AC and DC leads. Discharge capacitor before servicing.

STEP BY STEP OPERATING PROCEDURES

1. Provide adequate ventilation for both batteries and charger. The convection-cooled Lester-Matic requires an unobstructed flow of cooling air for proper operation.
2. Connect DC plug (portable unit) to vehicle receptacle.
3. Turn timer to "ON" for well discharged batteries or to "7" for lightly discharged batteries. Charger shuts off automatically at end of set period.
4. To determine approximate full charge at start of days use, turn timer knob to "1". Drop of ammeter needle to 1-4 amps in 15 minutes or less indicates full charge.
5. ALWAYS TURN TIMER TO "OFF" BEFORE DISCONNECTING CHARGER FROM BATTERIES.

PROPER CARE OF MOTIVE POWER BATTERIES

NEW BATTERIES

1. Brand new batteries should be given a 12 hour charge before their first use, because it is difficult to know how long vehicle batteries have been in storage without a charge since new.
2. Limit use of brand new batteries between charges for first 5 cycles. New batteries and older batteries which have been in storage are not capable of their rated output until they have been discharged and charged a number of times.
3. During the first month of new batteries, particularly when night-time temperatures are below 60 F, give them an extra 12 hour charge once a week. The ampere-hours of energy that batteries can deliver and their charge acceptance varies directly with battery temperature.
4. All batteries that still taper down into the 1-4 amps area of the ammeter toward end of charge should be given the full 12 hours of charge. All cells in a set of batteries do not react identically to the same discharge and charge current. In a normal 12 hours charge the last 3 to 5 hours at low finish charge rate equalize the cells for better battery life.
5. When batteries age to the point where charge rate no longer tapers into the 1-4 amps area of the ammeter, reduce the hours of charge progressively to 10 hours, 8 hours, and finally down to 6 hours near the end of useful life. As batteries age, their on-charge voltage at end of charge period drops progressively, thereby causing a high finish charge rate in amperes and resultant higher water use rates.

VERIFY BATTERIES ARE CHARGED

1. Turn on the timer first thing in the morning and check to see if charger ammeter needle jumps smartly to 15 amps or more and then tapers into the 1-4 amps area within 15 minutes. This will provide a very simple means of verifying that the batteries were truly charged the night before. It also shows aging batteries whose finish charge rate will not taper into the ammeter 1-4 amps area.
2. Add water carefully to proper level in cells as required after they have been fully charged. Do not fill them so high that they bubble over while charging. New batteries require very little additional water, whereas very old batteries may need additional water two or three times a week. Water (electrolyte) level in battery cells settles when batteries are discharged and rises during charge. The probability of overfilling can be reduced by adding water when batteries are fully charged.

PREVENTIVE MAINTENANCE

1. When night air temperatures fall below 65 degrees F, batteries charged in unheated areas should be placed on charge as soon after use as possible. Under such condition a 4 hour equalize charge once a week in the early afternoon will improve state of charge and battery life.
2. Keep tops of batteries and battery hold-downs clean and dry. Tops of batteries and battery hold-downs must be kept clean at all times to prevent voltage leakage and flow of current between the batteries and the vehicle frame.

PROPER CARE OF MOTIVE POWER BATTERIES (continued)

WARNING

LEAD ACID BATTERIES CONTINUOUSLY EMIT HIGHLY EXPLOSIVE GASES. DURING NORMAL VEHICLE OPERATION THE CONCENTRATION OF THESE GASES IS A POTENTIAL HAZARD TO BE CONSIDERED DANGEROUS WHEN 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 ANY TIME. LIGHTED CIGARETTES MUST NOT BE BROUGHT CLOSE TO THE BATTERY COMPARTMENT.

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.

MALFUNCTIONS SYMPTOMS AND THEIR REMEDIES

1. The Lester-Matic charger is designed with as few parts as possible. Since each component can be tested individually, trouble shooting is a simple task. The following is a list of symptoms with their associated test procedures and remedies.

NO TRANSFORMER HUM AND AMMETER DOES NOT REGISTER

In the event no hum is detected from the transformer, check the AC cord to be sure it is securely plugged into a live AC outlet. When three-prong to two-prong adapters are used, they tend to work loose giving a poor connection. If the cord connection is secure and still no hum is noticed, a continuity test of the AC circuit is necessary. Turn the timer to "ON" and, with a suitable continuity tester, check circuit across the AC plug prongs (Figure 1). CIRCUIT SHOULD BE COMPLETE. If not complete, individually check the AC cord, timer primary transformer coil, and all connections.

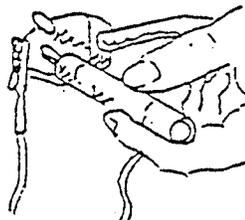


FIGURE 1

TRANSFORMER HUMS BUT NO AMMETER INDICATION

Inspect the DC plug connection to the vehicle receptacle and also check to ensure that the batteries are connected properly to the receptacle. If there is still no ammeter indication, a continuity test of the charger DC circuit must be performed. Turn the time to "OFF" and disconnect the AC and \*DC plugs. Perform the following tests, using a low voltage tester, to check the continuity of the DC circuit.

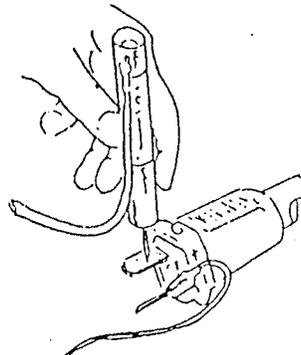
MALFUNCTION SYMPTOMS AND THEIR REMEDIES (continued)

TRANSFORMER HUMS BUT NO AMMETER INDICATION (continued)

- \* For built-ins, disconnect AC plug and DC leads to battery to isolate charger.
- (a) Connect tester clip to negative (-) blade and probe to positive (+) blade (Figure 2). CIRCUIT SHOULD BE COMPLETE. If not complete, first check the DC fuse link.

If one or both fuses have blown, the link will be broken and usually the clear plastic fuse cover will be discolored. Refer to "Fuse Link Blowing" for test procedures. If fuses are good, individually check the fuse connections, DC cord, and diode connections (each may be checked with the continuity test light).

NOTE: On built-in charger the red lead is (+) and black lead is (-) on DC output.



Typical plug.  
Check same  
polarity on  
other plugs.\*

FIGURE 2  
D.C. PLUG CHECK FOR PORTABLE CHARGERS ONLY

- (b) If the circuit in Figure 2 is complete, reverse test light leads as shown in Figure 3. CIRCUIT SHOULD NOT BE COMPLETE. If circuit is complete, check DC cord for a "short" between the two wires. More probably, one or both diodes have "shorted". Refer to "Fuse Link Blowing" part (b) for continuity test of diodes.

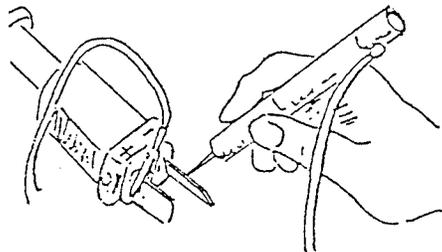


FIGURE 3  
D.C. PLUG CHECK FOR PORTABLE CHARGERS ONLY

**CAUTION:** Discharge capacitor before proceeding with (c). Momentarily apply plastic handled metal screw driver across both capacitor terminals.

MALFUNCTION SYMPTOMS AND THEIR REMEDIES (continued)

- (c) If (a) Figure 2 and (b) Figure 3 check good, assume the capacitor is shorted. Remove one wire from a capacitor terminal and place continuity tester clip to one terminal and probe to other. If circuit is complete, capacitor is "shorted" and must be replaced.

CHARGER DC FUSE LINK(S) BLOWS

This condition is caused by:

- (a) Reverse polarity between charger and batteries, such as incorrect installation of batteries, wiring of DC receptacle or charger plug.
- (b) A short circuit failure of one or both diodes. First disconnect one diode. Using a low voltage continuity tester check each diode as shown in Figure 4. Then reverse the tester leads and check each diode again. If the diode conducts current in both directions the diode is shorted and must be replaced. Replace either the entire heat-sink assembly or the defective diode. When replacing a single diode be sure the new diode is pressed squarely into the hole and does not extend beyond the rear surface of the heat-sink plate.

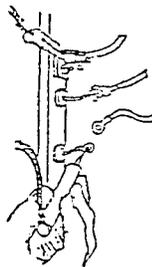


FIGURE 4

- (c) If (a) and (b) fail to reveal the malfunction, check wiring of both charger and vehicle against their respective wiring diagrams.

CHARGER OUTPUT IS LOW

The most probable cause is one diode shorting and blowing one fuse. Refer to "Fuse Link Blowing" part (b) to check the diodes. If a diode is shorted both the heat sink and fuse assemblies must be replaced.

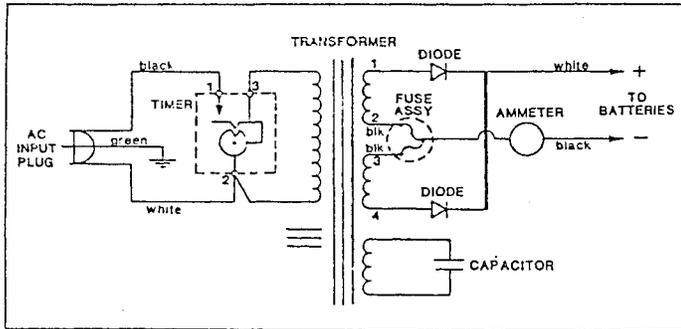
CHARGER DOES NOT TURN OFF

In models equipped with timers, this is due to an inoperative timer. In this case replace timer assembly.

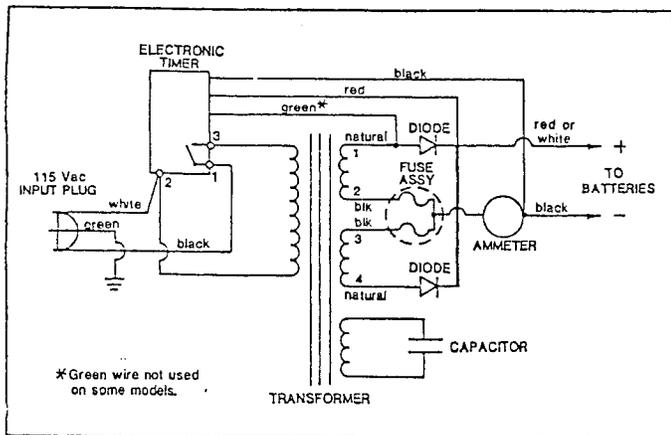
AC LINE FUSE OR CIRCUIT BREAKER BLOWS

If this occurs when charger is turned on without being plugged into the vehicle, the AC cord, timer motor coil, or the transformer may be shorted. To check the AC cord, ensure that the timer is "OFF" and connect the continuity tester across the AC plug prongs. If circuit is complete the AC cord is shorted and must be replaced. To check the timer motor coil, disconnect the white timer motor wire and connect continuity tester to the motor coil leads. If the lamp glows, the coil is shorted. To test the transformer, disconnect secondary leads #1 and #4. If the AC fuse or breaker still blows, the transformer is shorted internally and must be replaced.

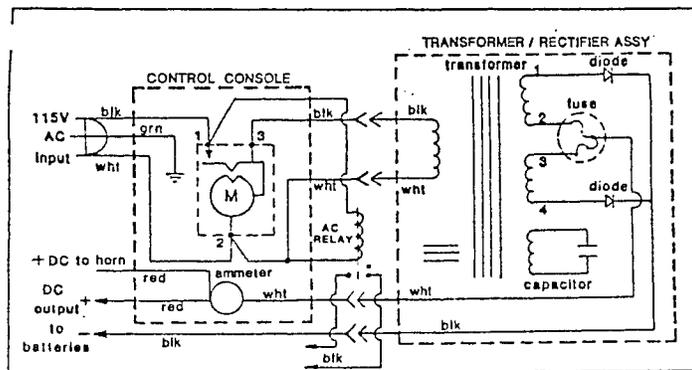
SCHEMATICS, LESTER CHARGERS



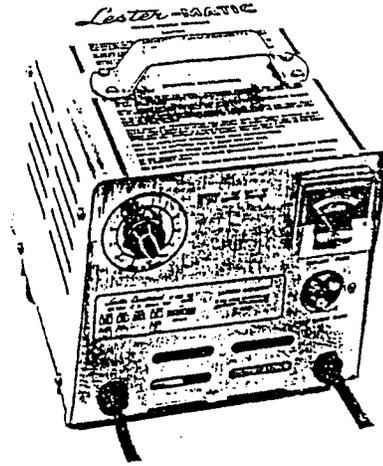
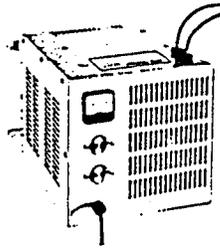
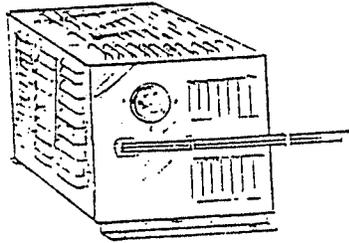
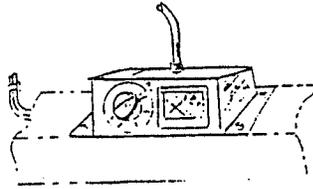
TYPICAL PORTABLE CHARGER



TYPICAL PORTABLE ELECTRONIC CHARGER (LESTRONIC II)



SCHEMATIC  
TYPICAL, ALL BUILT-IN CHARGERS



CHARGERS (TYPICAL)

TAYLOR-DUNN PART NO.	PORTABLE 79-304-00	BUILT-IN 79-304-05	PORTABLE 79-305-00	BUILT-IN 79-305-05
LESTER MODEL NO.	36LC25T12 115/60 9611	36LC25-3T12 115/60 7660	PORTABLE LESTRONIC II 36LC25 115/60 7850	LESTRONIC II 36LC25 115/60 9655
TRANSFORMER/RECTIFIER ASSEMBLY, COMPLETE				
TRANSFORMER	79-644-28	79-644-16	79-644-27	79-644-27
CAPACITOR	79-902-00	79-902-00	79-902-00	79-902-00
HEAT SINK ASSEMBLY W/DIODES	79-749-13	79-749-11	79-749-13	79-749-11
DIODE REPLACEMENT	79-745-10	79-745-10	79-745-10	79-745-10
FUSE ASSEMBLY	79-831-00	79-831-00	79-831-00	
CONTROL CONSOLE ASSEMBLY				
BUSHING FOR CORDSETS	79-530-00	79-530-00	79-530-00	79-530-00
HOUSING		79-599-10		
TIMER	79-805-60	79-805-60	ELECTRONIC 79-805-63	ELECTRONIC 79-805-67
KNOB, TIMER	79-806-00	79-806-00		
AMMETER	79-851-10	79-851-10	79-851-10	
CORDSET, A.C.		79-575-10		79-575-10

MAINTENANCE PROCEDURE  
FRONT AXLE, STEERING AND TIRES

Your front axle and wheel assembly consists of an axle mounted on 2 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 bearings and the spindles are mounted with heavy kingpins.

Zerk type grease fittings have been provided to ensure 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 4 and 5 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 service and adjustment in this section for guidance when performing major repairs and adjustments.

If your vehicle is equipped with 4 wheel hydraulic brakes, refer to the service and adjustment portion under "Hydraulics Brake" in Section 12 for their proper care and adjustment.

The steering worm gear box and steering linkage is similar to those used on autos. It requires very little attention. Refer to "Disassemble and Reassemble Steering Worm Assembly" in this section.

Refer to Maintenance Guide and Lubrication Diagrams, section 4 and 5 for normal care.

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

REMOVE AND INSTALL WHEEL HUB: ADJUST BEARINGS

1. Remove wheel cover
2. Remove dust cap
3. Remove cotter pin and unscrew spindle nut
4. Remove washer and bearing
5. Remove wheel, tire and hub assembly
6. Before re-assembly, thoroughly clean the bearings, spindle, and hub assembly. Inspect bearings for wear or damage. Examine inner seal. Replace damaged or worn parts.
7. Generously pack bearings with wheel bearing grease.
8. Reassemble in reverse order. Adjust wheel bearings before installing cotter pin.
9. Adjust wheel bearings by tightening spindle nut until bearing drag barely occurs, then back off spindle nut approximately 1/4 turn. Wheel should turn freely without noticeable bearing end play.
10. Install cotter pin, dust cap and wheel cover.
11. Wheel hub has one zerk fitting for periodic lubrication of bearing without disassembling hub. Refer to Lube Chart in Section 5.

SERVICE AND ADJUSTMENT continued  
FRONT AXLE, STEERING AND TIRES

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.
- 2a. Disconnect drag link ball joint at Pitman Arm, remove cotter pin and nut, rap stud sharply with soft hammer, or soft block and regular hammer, to loosen tapered stud from Pitman arm.
3. Remove 7/8 lock nut which retains spindle and steering arm assembly to king pin.
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 axle yoke.
6. Press bushings from spindle.
7. Thoroughly clean bushing housing and king pin before installing new bushings.
8. Press bushing into sleeve. If proper press is not available, most automotive supply houses and repair shops have 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. When yoke and king pin are assembled to axle, drive king pin home to seat serrations into top yoke plate. Install nut to bearly touch yoke plate. DO NOT DRAW YOKE PLATES TOGETHER.
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".

ALIGN FRONT END: ADJUST TOE-IN (SEE STEERING ADJUSTMENT SECTION 5)

Caster and camber are set at the factory and do not require adjustment. To adjust toe-in, raise front end of vehicle off the ground; follow diagram Section 5, "Steering Adjustment".

REMOVE AND REPLACE BALL JOINT

1. Remove cotter pin and nut.
2. Loosen sleeve clamp.
3. Rap ball joint stud sharply with soft hammer or soft block and regular hammer to loosen tapered stud from steering arm.
4. 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.
5. Install new ball joint and position same as the one removed.
6. Install tapered stud in steering arm or Pitman Arm.
7. Replace nut, tighten securely and replace cotter pin before tightening ball joint in Pitman Arm. Make any necessary adjustments to coordinate (center) steering wheel when tires are aligned.
8. If ball joint replaced is part of the tie-rod, check toe-in and adjust if necessary - as described in subsection titled "Align Front End".
9. Tighten both sleeve clamps securely.
10. Lubricate ball joint through zerck fittings. Refer to Lube Chart in Section 4.

SERVICE AND ADJUSTMENT continued  
FRONT AXLE, STEERING AND TIRES

REMOVE AND REPLACE STEERING WORM ASSEMBLY

1. Pry steering wheel cap up to expose locknut.
2. Use wheel puller to remove steering wheel.
3. Remove steering arm with wheel puller.
4. Remove the 3 mounting bolts at bottom of steering assembly
5. Remove U-bolt and lift out steering assembly.
6. Install steering gear with 3 mounting bolts.
7. Install U bolt.
9. Install steering wheel loosely. Center steering gear, turn full left return one and three quarters. Steering gear is now centered.
10. Install arm.
11. Center steering wheel and tighten nut.
12. Check that you will be able to turn the steering mechanism equally in both directions. If you cannot, it means the steering arm was not properly installed and it will be necessary to remove the arm and replace it in the proper position.
13. Lubricate steering worm through zerck fitting located on worm housing.

FRONT AXLE AND STEERING R 3-80

I.D NO.	PART NO.	DESCRIPTION	QTY.
1	18-312-00	ASSEMBLY, STEERING GEAR	1
2.	19-011-10	COVER, STEERING WHEEL	1
3.	88-199-82	5/8 NF HEX JAM NUT	1
4.	19-011-20	WHEEL STEERING	1
5.	86-006-00	SHOCK ABSORBER	2
6.	86-006-01	HARDWARE, SHOCK MOUNTING	2
7.	85-506-00	SPRING, 2 LEAF	2
8.	96-123-15	U-BOLT	4
9.	14-380-98	SPINDLE, LEFT	1
10.	14-380-99	SPINDLE, RIGHT	1
11.	02-380-45	STEERING ARM	1
12.	18-040-07	STEERING SLEEVE, 18"	2
13.	12-124-00	FRONT HUB	2
14.	96-329-00	LUG BOLT	10
15.	97-236-00	LUG NUT	10
16.	92-104-00	DUST CAP	2
17.	80-017-00	1 INCH ID TAPERED BEARING	4
18.	80-103-00	TAPERED BEARING RACE	4
19.	45-338-00	OIL SEAL	2
20.	<del>21-020-00</del>	KING PIN <b>21-020-10</b>	2
21.	97-180-55	THRUST WASHER	4
22.	15-380-12	FRONT AXLE	1
23.	88-189-81	5/8 NC LOCK NUT	2
24.	88-228-61	3/4 SAE WASHER	2
25.	88-239-85	3/4 NF HEX SLOTTED NUT	2
26.	88-527-11	1/8 X 1 STEEL COTTER PIN	8
27.	86-501-98	BALL JOINT, LEFT	2
28.	86-501-99	BALL JOINT, RIGHT	1
29.	86-501-00	ASSEMBLY, BALL JOINT CLAMP	3
30.	87-074-00	GREASE FITTING	5
31.	86-519-00	ROD END, 3/8 NF, RIGHT HAND, FEMALE	1
32.	88-119-80	3/8 NF HEX HEAD NUT	1
33.	00-380-09	PLATE, SPRING MOUNT, REAR	2
34.	00-380-72	PLATE, SPRING MOUNT, FRONT	2
35.	32-240-55	BEARING, TEFLON, 5/8 ID	4
36.	88-129-81	7/16 NC LOCK NUT	2
37.	88-109-81	3/8 NC HEX LOCK NUT	17
38.	16-506-00	SPACER	2
39.	88-100-15	3/8 X 1-3/4 HEX HEAD SCREW	9
40.	88-121-19	7/16 X 2-3/4 NC HEX SCREW	2
41.	12-012-00	WHEEL, 4.80, 5.80 X 8, 5 HOLE (WITH 13-734-00) (WITH 13-742-00)	0 OR 4
	12-042-00	WHEEL, 5.70 X 8, 5 HOLE, SPLIT RIM (WITH 13-742-10) (WITH 13-742-11)	0 OR 4
	12-020-00	WHEEL, 18 X 8.50 X 8, 9.50 X 8, 5 HOLE	0 OR 4



## FRONT AXLE AND STEERING R 3-80 continued

I.D.NO.	PART NO.	DESCRIPTION	QTY.
42.	13-746-10	ASSEMBLY, TIRE, WHEEL 8 X 8.50 X 8	Ø OR 4
	13-742-00	ASSEMBLY, TIRE, WHEEL, 5.70 X 8	Ø OR 4
	13-742-10	ASSEMBLY, TIRE, SPLIT RIM, 5.70 X 8 FOAM	Ø OR 4
	13-742-11	ASSEMBLY, TIRE, SPLIT RIM, 5.70 X 8	Ø OR 4
	13-734-00	ASSEMBLY, TIRE, WHEEL, 4.80 X 8	Ø OR 4
43.	10-081-00	TIRE, 5.70 X 8 LOAD RANGE B, HIGHWAY TREAD	Ø OR 4
	10-075-00	TIRE, 4.80 X 8 LOAD RANGE B, HIGHWAY TREAD	Ø OR 4
	10-093-00	TIRE, 18 X 8.50 X 8 TERRA TIRE	Ø OR 4
44.	88-159-85	1/2 NF HEX SLOTTED NUT	5
45.	18-040-11	ASSEMBLY, STEERING SLEEVE	1
46.	32-215-00	Bushings for steering pivot arm	2

R 3-80  
STEERING WORM ASSEMBLY  
PART NUMBER 18-312-00

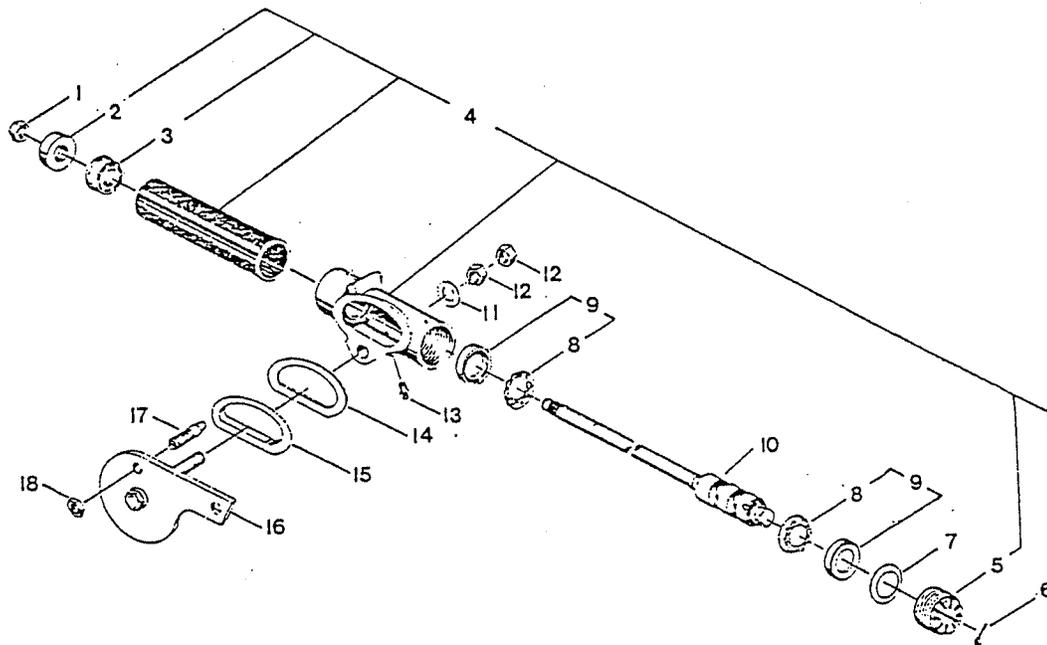


FIG. ID	PART NO.	DESCRIPTION	QTY.
1	88-199-82	5/8 NF HEX JAM NUT	1
2	97-200-00	DUST COVER	1
3	18-311-55	COLUMN BEARING	1
4	18-312-58	HOUSING ASSEMBLY	1
5	18-312-53	ADJUSTING PLUG	1
6	88-527-06	COTTER PIN	1
7	18-312-52	WASHER, ADJUSTING PLUG	1
8	18-311-53	RETAINER ASSEMBLY	2
9	18-311-56	KIT, BALL CUP	Ø OR 2
10	18-312-51	CAM AND TUBE ASSEMBLY	1
11	88-228-61	3/4 WASHER, SAE	1
12	88-239-82	3/4 JAM NUT, NF	2
13	87-077-00	GREASE FITTING	1
14	18-312-55	SEAL	1
15	18-312-56	SEAL RETAINER	1
16	18-312-57	LEVER ASSEMBLY	1
17	18-312-54	LEVER STUD	1
18	88-179-80	9/16 HEX JAM NUT	1

BELT TENSION ADJUSTMENT AND ALIGNMENT - BELT DRIVE VEHICLES

NOTE: New belts will 'seat-in' rapidly, therefore, re-adjust belt tension after only a few hours of running to prevent undue slippage and wear. It may be necessary to repeat the adjustment procedure two or three times within the first week or two of running until the new belts become thoroughly 'seated-in'.

1. CAUTION: Disconnect both main battery leads to prevent accidental engagement of power while servicing unit.
2. Loosen motor mount clamp nuts slightly.
3. Loosen motor adjusting bolt lock nut and turn adjusting bolt in or out as needed to tension belts properly.

NOTE: Belt tension is correct when belts will deflect between 1/4" and 3/8" at the mid point between pulleys. Press each belt firmly at the mid point with your thumb or finger and measure the deflection at the same point.

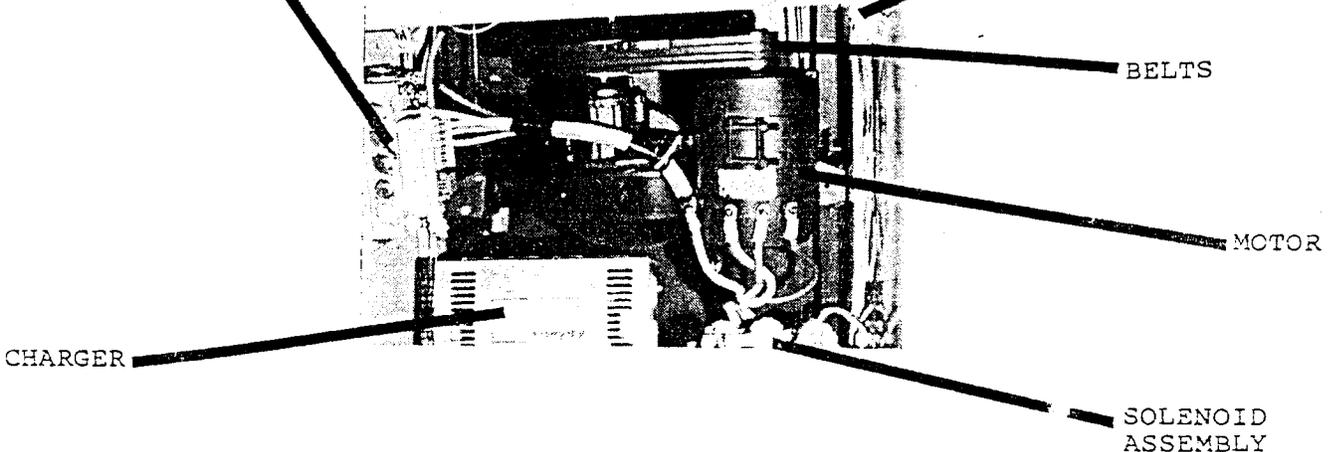
4. Rotate drive pulley sufficiently so belts will travel at least one full turn and check belt tension again. This will allow belts to seat properly in grooves. Repeat tension adjustment as necessary until satisfactory results are obtained.
5. Tighten lock nut on tension adjustment bolt, holding bolt in position with one wrench while tightening lock nut with second wrench.
6. Check pulley alignment on its mounting bracket to bring pulleys into alignment. If necessary tap motor mount bracket into position with soft hammer.
7. Retighten motor mount clamp nuts securely.

REPLACEMENT OF BELTS - BELT DRIVE VEHICLES

1. CAUTION: Disconnect both main battery leads to prevent accidental engagement of power while servicing unit.
2. Loosen motor mount clamp nuts slightly.
3. Loosen motor adjusting bolt lock nut and turn adjusting bolt in until belts can be easily lifted from pulley grooves without prying or forcing. Remove old belts.
4. Install a full set of new belts of equal length. Replacement of only a part of the set will prevent obtaining proper tension of all belts. This will cause unequal division of load among the belts with abnormal wear as a result.
5. Adjust tension and alignment as described above.

PT 240 PWR-TRON  
(COVER REMOVED)

12 VOLT ACCESSORY  
CIRCUIT BREAKER



REAR COMPARTMENT

MAINTENANCE, SERVICE AND PARTS  
POWER TRACTION

ADJUSTMENT OF DRIVE CHAIN TENSION - POWER TRACTION

1. **WARNING:** Disconnect both main battery leads to prevent accidental engagement of power while servicing vehicle.
2. Tighten three motor mounts.
3. Loosen and unscrew each nut exactly one full turn.  
**WARNING:** This procedure is very important, for if the nuts are too loose or too tight, an error will result in the final adjustment which will seriously reduce the life of the chain.
4. Loosen adjusting set screw lock nut. Using standard socket set screw wrench, turn set screw clockwise until tight. (If a torque wrench is available, tighten to 80 in lbs torque). Without a torque wrench, bear in mind that a standard socket set screw wrench is approximately 4 inches long. An average person will only be able to develop the required torque necessary if he tightens it as far as possible with his hands and does not use any extended handle on the wrench.
5. After developing the required torque, unscrew the adjusting screw exactly 2-1/2 turns. It is also very important to be exact on this adjustment.
6. Tighten locknut. DO NOT allow adjusting screw to move while tightening locknut.
7. Be certain that motor has moved all the way back and adjusting screw is in contact with back plate. If necessary, tap motor lightly to assure this condition.
8. Tighten three motor mount nuts securely.

Perform this adjustment procedure regularly as listed below to assure long and trouble free life from your "Power Traction Drive".

SCHEDULED ADJUSTMENT	AFTER	COMMENTS
1st Adjustment	100 Hours	New unit or after installing new chain
2nd Adjustment	Next 150 Hours	Normal running conditions
3rd Adjustment	Next 250 Hours	Normal running conditions
Thereafter	Every 400 Hours	Normal running conditions

"QUICK" MOTOR REMOVAL PROCEDURE - POWER TRACTION

**NOTE:** This procedure is a quick method of removing the motor without removing the chain case cover. If removal of the chain case becomes necessary, refer to Sub-Section titled "Disassembly and Reassembly Power Traction Drive Assembly".

1. **WARNING:** Disconnect both main battery leads to prevent accidental engagement of power while servicing unit.
2. Drain oil from gear case by removing drain plug.
3. Identify motor leads from proper connection when reassembling. Remove motor leads.
4. Loosen 3 motor mount nuts and the adjusting set screw lock nut.
5. Back-off adjusting screw sufficiently so as to allow motor mounting adjustment plate to be fully bottomed. This will allow for easy removal of motor.
6. Remove the 3 motor mounting nuts and washers. Carefully ease motor out of opening after removing chain from motor sprocket.

"QUICK" MOTOR INSTALLATION PROCEDURE - POWER TRACTION

1. If installing new motor, clean motor and motor mounting plate surfaces. Install motor mounting plate to motor (take care to position motor on plate properly) with 4 flat-head cap screws previously removed. Tighten screws to 30 ft. lb. torque and stake head in place with center punch.
2. If installing new motor, or if sprocket has been removed to repair motor, assemble spacers, key, sprocket, washer and shaft nut to motor shaft in the same manner as previously removed. Tighten shaft nut to 75 ft. lb. torque.
3. Place "O" ring in motor mounting plate opening.
4. Using a piece of wire (coathanger, etc.), reach through the opening in the chain case backing plate and lift the chain above the opening. Secure the chain in this position by attaching the wire to the top mounting bolt, etc.
5. Remove a motor brush inspection cover so that the armature is plainly visible.
6. Rotate the motor slightly in the direction of the passengers seat so that the motor mounting plate clears the studs attached to the Chain case backing plate.
7. Carefully slip the motor sprocket in the hole and under the drive chain.
8. In this position move the vehicle slightly forward and backwards while observing the correct movement of the motor armature through the brush inspection opening.
9. Now, carefully reposition the motor onto the studs and install washers, lock washers and nuts. DO NOT TIGHTEN NUTS. FINGER TIGHT ONLY.
10. Move the vehicle slightly forward and back and re-check the armature movement to insure chain has not slipped off sprocket. **CAUTION: If chain is not properly positioned on sprocket, severe damage could occur to the Power Traction Component parts.**
11. Adjust chain tension as described in Sub-section titled "Adjustment of Drive Chain Tension".

DISASSEMBLY AND REASSEMBLY OF POWER TRACTION DRIVE ASSEMBLY

1. Perform steps 1, 2 and 3 in Sub-section titled "Quick Motor Removal Procedure - Power Traction".
2. Remove remaining bolts and nuts from front of chain case cover. Remove chain case cover.
3. Remove the three nuts and washers which fasten motor to motor mounting plate. Disengage chain from motor sprocket. Remove motor, motor mounting plate and sprocket from chain case backing plate.
4. Remove "O" ring from motor mounting plate.
5. Remove chain, pinion sprocket and spacers from pinion shaft.  
**NOTE: Spacer location for proper reassembly.**
6. If axle or differential maintenance requiring further disassembly is necessary, remove chain case backing plate and gasket by removing the 5 bolts which retain the backing plate to the differential carrier. Refer to Sub-sections which cover axle and differential disassembly and reassembly.
7. To reassemble, install chain case backing plate and gasket to differential carrier with 5 bolts previously removed. Use gasket sealer. Tighten bolts to 50 ft. lbs. torque. Install chain on pinion sprocket.
8. Install "O" ring in motor mounting plate and attach motor and motor mounting plate to chain case backing plate.
9. Engage chain with motor sprocket and secure motor mounting plate to chain backing plate with 3 nuts and washers previously removed.  
**NOTE: Chain adjustment procedure is covered in Sub-section titled "Adjustment of Drive Chain Tension - Power Traction".**
10. Install chain case cover and gasket to chain case backing plate. Replace gasket if damaged. Tighten gear case cover retaining bolts and nuts.
11. Fill gear case with oil. Refer to lube chart in Section 2.
12. Connect motor leads.
13. Connect battery main leads.

REMOVE AND INSTALL REAR WHEEL BEARING, POWER TRACTION AND BELT DRIVE

1. **WARNING:** Disconnect both main battery leads to prevent accidental engagement of power while servicing vehicle.
2. Remove wheel and tire assembly.
3. Remove 4 bolts attaching disc brake mounting bracket to Drive Axle housing after first bending clip locking tabs out of the way (4 clips, 8 tabs).
4. Remove 2 bolts and nuts attaching the caliper actuating lever to the caliper three hole position lever.
5. Remove caliper assembly from axle.
6. Remove axle from housing.  
**CAUTION:** If axle is difficult to remove from housing, use an axle puller that is designed for that purpose. Never use a hammer or other metal object to help drive the axle from the housing. Damage to the disc rotor could occur resulting in severe damage to the brake system and/or loss of brakes on one side.
7. Pull bearing retainer ring band bearing from axle shaft.
8. Press new bearing to shoulder on axle shaft. Press new bearing retainer ring into position on axle shaft.
9. Check condition of oil seal and replace if necessary.
10. Carefully install axle into axle housing and differential assembly.
11. Attach brake caliper, assemble to housing. Secure with 4 bolts and 2 double tab clips. Tighten bolts to 35 ft. lb. torque. Now bend locking tabs up against their respective bolts.  
**WARNING:** Failure to bend locking tabs up properly against bolts could eventually result in loss of braking action due to bolts becoming loose.

REMOVE AND INSTALL REAR AXLE DRIVE ASSEMBLY FROM AND TO VEHICLE  
- POWER TRACTION AND BELT DRIVE -

1. **WARNING:** Disconnect both main battery leads to prevent accidental engagement of power while servicing vehicle
2. Mark motor leads to insure their proper location when re-assembling.
3. Remove motor leads.
4. Release parking brake (if applied)  
**NOTE:** Refer to Section 7, Sub-section titled "Brake Adjustment Procedure for when all Brake adjustment screw travel has been Used-Up" before continuing with step 5.
5. Remove clevis pins holding rear brake connecting rods to cross-shaft.
6. Remove lower bolts from shock absorbers.
7. Remove top bolt from torque arm at drive.
8. Remove 2 bolts and nuts which attach axle housing to main leaf spring each side.
9. Remove drive axle assembly from vehicle.
10. Before re-installing drive axle assembly in vehicle, examine rubber bushings in leaf springs and replace if worn or damaged.
11. Install drive axle assembly in reverse order of removal.
12. Re-connect torque arm, shocks, and brake linkage in reverse order of removal.
13. Check and adjust (if necessary) brake system according to procedures in Section 7. For mechanical disc brakes refer to your "Operator's Manual".
14. Connect main battery cables.

DISASSEMBLY OF REAR AXLE AND DIFFERENTIAL ASSEMBLY  
- POWER TRACTION AND BELT DRIVE -

1. Remove drive axle assembly from chassis, remove motor and chain drive assembly as described in appropriate Sub-sections.
2. Remove both axles. Refer to Sub-section Remove and Install Rear Wheel Bearings
3. Remove nuts around differential carrier housing and remove carrier from axle housing.

DISASSEMBLY OF REAR AXLE AND DIFFERENTIAL ASSEMBLY  
- POWER TRACTION AND BELT DRIVE - continued

4. Mark one differential bearing cap and bearing support to insure proper assembly. Remove adjusting nut locks, bearing caps, and adjusting nuts. Lift differential out of carrier.
5. Remove ring gear pinion from differential case.
6. Drive out differential pinion shaft retainer and separate the differential pinion shaft and remove gears and thrust washers.
7. Remove ring gear pinion retainer from carrier. Remove O-Ring from retainer.
8. Remove pinion locating shim. Measure shim thickness with micrometer.
9. If the ring gear pinion pilot bearing is to be replaced, drive the pilot end and bearing retainer out at the same time. When installing, drive the bearing in until it bottoms. Install a new retainer with the concave side up.
10. Press the ring gear pinion shaft out of front bearing cone and remove spacer.
11. Remove ring gear pinion bearing cone.
12. Do not remove ring gear pinion bearing cups from retainer unless they are worn or damaged. The ring gear pinion bearing flange and pilot are machined by locating on these cups after they are installed in the bores. If new cups are to be installed, make sure they are seated in the retainer by trying to insert a .0015" feeler gauge between cup and bottom of bore.

REASSEMBLY OF REAR AXLE AND DIFFERENTIAL ASSEMBLY - ALL VEHICLES

1. Differential Case: Place a side gear and thrust washer in the differential case bore. LUBRICATE ALL PARTS LIBERALLY WITH AXLE LUBRICANT DURING ASSEMBLY. With a soft faced hammer, drive pinion shaft into case only far enough to retain a pinion thrust washer and pinion gear. Place the second pinion and thrust washer in position. Drive the pinion shaft into place. Be careful to line up pinion shaft retainer holes. Place second side gear and thrust washer in position and install differential case cover. Install retainer. A pinion or axle shaft spline can be inserted in side gear spline to check for free rotation of differential gears.
2. If the differential bearings have been removed, use a suitable press to install them.
3. Install pinion rear bearing cone on the pinion shaft. Install spacer with shims on the shaft. Place the bearing retainer on the pinion shaft, and install the front bearing cone. Lubricate both bearings with differential oil.
4. Power Traction: Place spacers and sprocket on pinion shaft spline. Install washer and shaft nut and tighten to 100 ft. lb torque.  
Belt Drive: Place spacers and pulley on pinion shaft spline. Install washer and shaft nut and tighten to 100 ft. lb. torque.  
NOTE: The bearing should spin freely without end play. If it is too tight or too loose, adjust by removing or adding spacers.
5. Shim Selection: Manufacturing tolerances in the pinion bore dimensions and in the best operation position of the gears, make an adjustment shim necessary. This shim is placed between the pinion retainer and the carrier. An increase in the thickness of the shim moves the pinion away from the drive gears. Manufacturing objectives are to make axles requiring a .0015" shim and if a new assembly is being built, a .0015" shim should be used for a tentative build-up. Shims are available in .010" to .021" thickness in steps of .001". Pinions and drive gears are marked, when matched, with the same number. Following the numbers on the pinion is a (-) or (+) followed by a number. If the pinion is marked "-1" it indicates that a shim .001" thinner than a standard shim for this carrier is required.

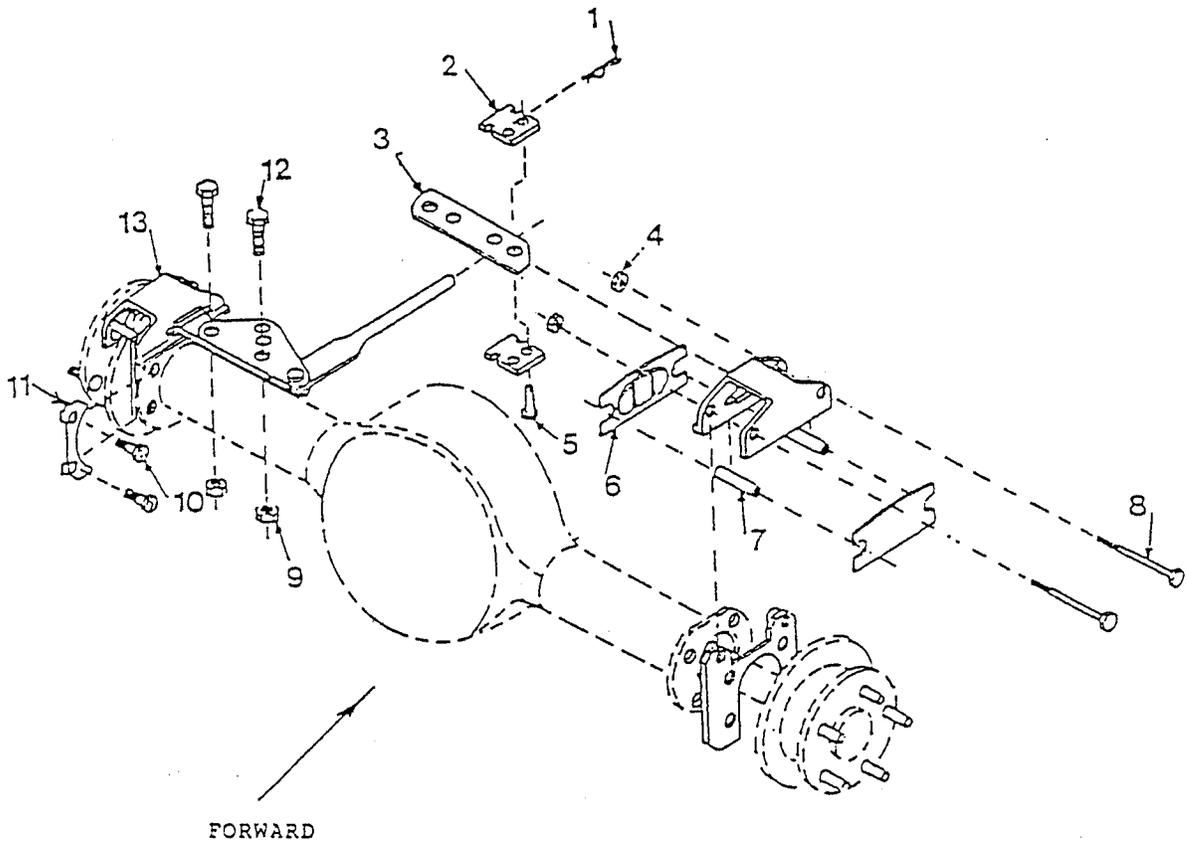


BELT DRIVE & POWER TRACTION PARTS LIST  
MECHANICAL DISC BRAKES

FIG. I.D.	PART NO.	DESCRIPTION	QTY.
1	41-301-40	Weldment, Housing, Diff., BD, F3	1
1a	41-301-41	Weldment, Housing, Diff., F3 PWR-TRON	1
2	96-328-00	Bolt, 3/8 x 5/8 NC, Special Hd, Gr. 5	1
3	41-997-00	Plug, Pipe, 1/8	3
4	88-527-11	1/8 x 1 Cotter Pin	1
5	45-297-00	Seal, Oil, 1.375 x 2.565	0 or 2
	45-296-00	Seal, Oil, 1.375 x 2.088	0 or 2
	45-299-00	Seal, Oil, 1.375 X 2.265	0 or 2
	45-296-00	Seal, oil, 1.375 x 2.378	0 or 2
6	32-516-00	Retainer Ring	2
7	45-044-00	Gasket	2
8	80-491-00	Ball Bearing, Axle	2
9	41-151-10	Axle Assembly	2
10	85-507-00	2 Leaf Spring	2
11	16-861-00	Spring, Pad	2
12	88-100-15	3/8 x 1-3/4 NC Hex Hd Screw	8
13	88-109-81	3/8 NC Lock Nut	8
14	80-127-00	Race, Tapered Roller Brg.	2
15	80-511-00	Bearing, Tapered Roller	2
16	41-702-00	Thrust Washer	2
17	41-703-00	Kit, Differential Pinion Gear	1 kit
18	41-704-00	Thrust Washer	2
19	41-705-00	Kit, Differential Side Gear	1 kit
20	41-725-00	Case, Differential Gear	1
21	96-243-00	7/16 x 7/8 NF, Grade 5 Bolt	10
22	97-163-00	Washer, 7/16 ID x 3/4 OD	10
23	88-139-80	7/16 NF Nut	10
24	41-700-00	Shaft, Differential, Pinion	1
25	41-701-00	Tension Pin	1
26	88-140-16	1/2 x 2 NC Hex Bolt	4
27	88-080-09	5/16 x 3/4 NC Hex Bolt	4
28	41-706-00	Nut Lock, Differential Bearing Adjust	2
29	41-707-00	Nut, Differential Bearing Adjust	2
30	41-726-00	Differential Carrier	1
31	45-051-00	Gasket, Differential Carrier	1
32	88-119-80	3/8 NF Hex Nut	10
33	41-720-00	Shim, Dr. Pinion Bearing, .005 Thk.	1 to 3
34	80-703-00	O-Ring	1
35	80-557-00	Bearing, Roller, RR Pinion	1
36	41-721-00	Bearing Retainer	1
37	31-260-00	Set, Gear, 2.75 Ratio	0 or 1
	31-261-00	Set, Gear, 3.00 Ratio	0 or 1
	31-264-00	Set, Gear, 4.63 Ratio	0 or 1
38	80-556-00	Bearing, Tapered Roller	2
39	80-139-00	Race, Tapered Roller Bearing	2
40	41-341-10	Flange, Pinion Bearing	1
41	45-050-00	Gasket, Pinion Flange	2
42	16-422-00	Spacer, .440 Thick	2
43	16-440-00	Spacer, .002 Thick	2 to 6
	16-441-00	Spacer, .005 Thick	2 to 6
44	16-442-00	Spacer, .010 Thick	0 to 2
45	45-301-00	Seal, Oil, Pinion Shaft	1

BELT DRIVE & POWER TRACTION PARTS LIST  
MECHANICAL DISC BRAKES continued

FIG. I.D.	PART NO.	DESCRIPTION	QTY.
46	88-101-13	3/8 NC X 1-1/4 Grade 5 Bolt	5
47	88-103-63	3/8 Int. Tooth Lock Washer	5
48	30-121-00	Pulley, Large, Belt Drive	1
49	30-158-00	Pulley, 2.43 OD (Standard)	1
	30-159-00	Pulley, 3.00 OD	1
50	30-621-00	Belt, 3V Section	4
51	96-316-00	Bolt, All Thread, 1/2 x 3 NC	1
52	88-149-80	1/2 NC Hex Head Nut	1
53	41-301-18	Motor Adj. Bracket	1
54	70-434-00	Motor Mount	1
55	88-101-18	3/8 x 2-1/2 NC Hex Bolt, Grade 5	2
56	88-109-87	3/8 Keps Nut	6
57	70-422-00	Strap, Motor Mount	2
58	88-089-80	5/16 NC Hex Head Nut	1
59	88-087-11	5/16 x 1 NC Socket Set Screw	1
60	70-454-00	Plate, Motor Mount	1
61	88-103-09	3/8 x 3/4 NC Socket Flat Screw	4
62	44-353-10	Backing Plate, Chain Case	1
63	45-002-00	Gasket, Chain Case Cover	1
64	88-101-13	3/8 x 1-1/4 NC Hex Bolt Grade 5	1
65	88-108-60	3/8 Washer	4
66	88-409-87	3/8 Keps Nut	3
67	88-089-81	5/16 NC Locknut	12
68	41-989-00	Drain Plug, 1/4 Pipe Thread	3
69	16-418-00	Spacer, .140 Thick	1
70	30-080-00	Sprocket, 15 Tooth, 17/32 Face	1
71	97-100-00	1/8 x 5/8 Woodruff Key	1
72	30-094-00	Sprocket, 81 Tooth, 17/32 Face	1
73	88-239-82	3/4 NF Hex Jam Nut	1
74	30-504-20	Chain, SSG, 13/16 W, 37-1/2 Long	1
75	97-250-00	Nut, Pinion, 3/4-20 Extra Fine	1
76	88-080-19	5/16 x 2-3/4 NC Hex Bolt	9
77	88-088-61	5/16 SAE Washer	3
78	43-201-30	Cover, Chain Case	1



R 3-80 MECHANICAL DISC BRAKES

FIG. I. D.	PART NO.	DESCRIPTION	QTY.
1	41-348-56	PIN, HITCH	2
2	41-348-54	PLATE, PIVOT	4
3	41-348-51	LEVER, ACTUATING	2
4	88-069-88	NUT, HEX 1/4, HEAT TREATED, GRADE 8	4
5	41-348-55	PIN, CLEVIS	2
6	41-348-70	PAD, DISC BRAKE	4
7	41-348-52	SPACER	4
8	88-067-18	BOLT, HEX HEAD 1/4 X 2-1/2, GRADE 8	4
9	88-089-81	NUT, HEX LOCK 5/16	4
10	96-327-00	BOLT, SPECIAL HEAD, 3/8 X 3/4, GRADE 5	8
11	41-348-59	CLIP, W/DOUBLE LOCKING TABS	4
12	88-080-10	SCREW, HEX HEAD, 5/16 NC	8
13	41-348-98	ASSEMBLY BRAKE, MECH. CALIPER, L.H.	1
	41-348-99	ASSEMBLY BRAKE, MECH. CALIPER, R.H.	1

MAINTENANCE PROCEDURES  
MECHANICAL DISC BRAKE SYSTEM

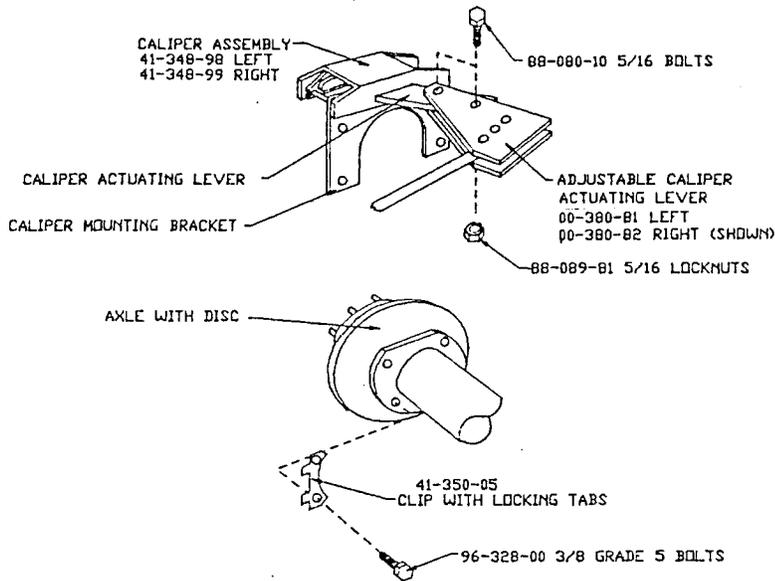
MAINTENANCE

The only maintenance required is periodic inspection and adjustment for brake pad lining wear.

NOTE: Normally, the only time the Taylor-Dunn mechanically actuated disc brake system needs adjustment is when pressure is applied to the service brake pedal and the pedal touches the vehicle floorboard without locking-up the wheels. In other words, the wheels cannot be locked through full brake application. Naturally, wheel lock-up is not a normal braking requirement and is only referred to as an example of when brake adjustment is required.

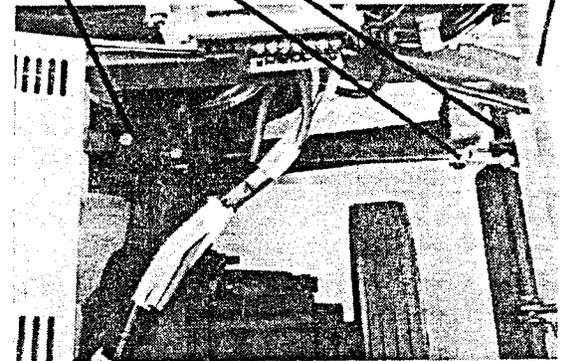
BRAKE ADJUSTMENT PROCEDURE

Adjust brakes using clevis. Remove pin in clevis arm. Turn clevis clockwise to tighten. Back off one turn. Return clevis arm to brake rod insert pin.



CALIPER ADJUSTMENT

BRAKE LEVER  
CLEVIS BRAKE ADJUST  
BRAKE ROD



BRAKE ADJUSTMENT, WHEN SCREW TRAVEL (CLEVIS ARM) HAS BEEN USED UP

When adjusting screws allow no more adjustment, remove pin, loosen adjustor then remove the outer 5/16" x 7/8" bolt from the caliper adjustable lever (both caliper adjustable levers). Loosen inner 5/16" bolts so that the caliper adjustable lever assembly can be moved to line up the #2 hole with outer hole in caliper actuating lever. Install 5/16" bolt and nut. Tighten both nuts securely. Repeat procedure on other caliper.

NOTE: As a matter of good maintenance practice, it is good practice to remove the brake pads for inspection prior to using hole #3 in the caliper adjustable lever. Pads should be thoroughly checked for unusual wear, etc. If inspection indicates less than 1/32" of lining material remaining, then all 4 pads must be replaced. (See next procedure for replacing disc pads.)

CAUTION: Never mix or cross pads from one wheel to another as accelerated wear-out of pad linings will occur. In addition, uneven braking action and damage to the rotor disc is probable.

MAINTENANCE PROCEDURES continued  
MECHANICAL DISC BRAKE SYSTEM continued

PROCEDURE FOR INSPECTING AND/OR REPLACING BRAKE PADS Part No. 41-348-70

1. Release park brake and block front wheels. Insure forward/reverse switch is in neutral and key turned to OFF.
2. Raise rear of vehicle and remove rear wheels (use safety stands).
3. Remove one (1) caliper bolt and sleeve from caliper body.
4. Carefully slide out disc pads.  
Note: Pads must be returned to original position in caliper. Note position before removal.
5. Examine pads for overall condition and wear. All pads must be replaced if any pad lining is worn to 1/32".
6. Reinstall original pads if inspection is satisfactory.
7. If inspection required replacement of pads, proceed to "NEW PAD Installalation Procedure".
8. While holding both pads in proper position, re-insert bolt sleeve to caliper body and slide bolt through caliper body and sleeve. Tighten nut to 10 foot pounds of torque.
9. Perform same procedures on opposite caliper.
10. Replace wheels on vehicle.
11. Return to brake adjustment procedure.

NEW BRAKE PAD INSTALLATION PROCEDURE

1. Remove the outer 5/16 bolt from the caliper adjustable lever assembly and loosen the inner bolt.
2. Now move the caliper adjustable lever assembly so that the #1 hole lines up with the outer hole in the caliper actuating lever.
3. Tighten both 5/16 bolts.
4. Repeat procedure for other side.
5. Return to step #8, "Procedure for Inspecting and/or Replacing Disc Brake Pads".

HYDRAULIC DISC BRAKES

The hydraulic disc brake system consists of three primary sub-systems.

1. The master cylinder with fluid lines.
2. The mechanical control linkage, showing park and foot brake interconnections to the caliper assemblies.
3. The caliper assembly as it mounts to disc.

Each rear wheel is fitted with a hydraulic (calipers) disc brake assembly.

Master cylinder fluid level should be checked monthly. Add fluid as needed to maintain level 3/8" to 1/2" from top of fill port. Use only approved hydraulic brake fluid, DOT #5, silicone.

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 pedal usually indicates air entrapment.

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 master cylinder socket.
2. Disconnect hydraulic line at cylinder. (There will be 2 lines on a 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 should be within 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 of insert clevis pin.
12. Tighten locknut and install cotter pin.

WHEN USING A BLEEDER TANK

1. Fill master cylinder to top with DOT #5 brake fluid or, if available, attach brake bleeder tank to master cylinder.
2. When using bleeder tank, loosen air bleeder valve (located at each wheel cylinder), one at a time. Allow fluid to flow until air pickets and bubbles stop and a clear stream appears.

WHEN BLEEDER TANK IS NOT AVAILABLE

It is necessary to utilize 2 people to bleed brake system when 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 2 people, air will be bled out by each downward stroke of the pedal. It is wise to refill master cylinder after every 3 or 4 strokes to ensure 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.

1. Allow vehicle to sit 15 minutes to stabilize. (Air bubbles can be trapped in silicone brake fluid and must be allowed to collect). Allow fluid to flow until air pockets and bubbles stop and a clear stream appears.
2. Remove brake bleeder tank if use. Fill master cylinder 3/8" to 1/2" of top and replace cover.

REPLACING BRAKE PADS AND ADJUST PARK BRAKE

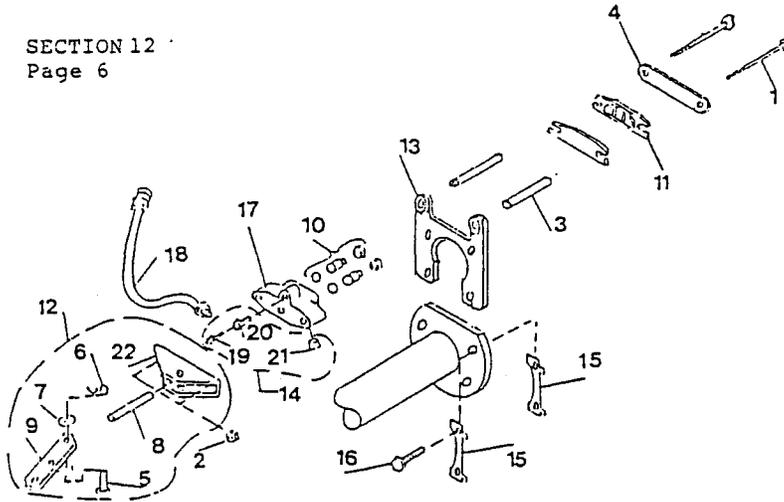
1. Release hand park brake.
2. Remove wheel.
3. Examine caliper assembly for worn pads. If plates are close to disc and hydraulic pistons are particularly extended, then pad replacement is necessary.
4. Replace pads by retracting plate against pistons to allow for plate replacement. If pistons are difficult to retract, loosen bleeder valve, (allow fluid to escape) push plate and immediately re-tighten bleeder valve to avoid trapping air.
5. Remove one retainer bolt and spacer, remove both stator plates.
6. Replace both stator plates.
7. Re-install stator bolts and spacers. Tighten to 12 foot pounds. Rotate disc to make sure there is running clearance. If not, install clips between bracket (see next page for installation drawing) and housing end.
8. Bleed brakes if required.
9. Adjust the park brake at the park brake arm (see next page for installation drawing). By removing the clevis pin, push brake rod forward as if applying the brakes. Now rotate rod to align holes in park arm then back off one full turn. Re-install clevis pin. Repeat same procedure for the other wheel.

REPLACING BRAKE CYLINDER PARTS (CALIPER ASSEMBLY)

**CAUTION:** BLOCK VEHICLE WHEELS, PLACE FORWARD/REVERSE SWITCH IN NEUTRAL, TURN KEY TO OFF POSITION AND REMOVE FROM SWITCH. SET PARK BRAKE.

1. Remove wheel.
2. Disconnect park brake at park brake lever on caliper assembly.
3. Disconnect brake line/hose at caliper, cap hose.
4. Bend down locking tabs on mounting bracket.
5. Remove mounting bolts.
6. Lift caliper assembly off vehicle.
7. It is only necessary to remove one bolt and spacer.
8. Remove pads.
9. Remove rubber boots.
10. Slide out pistons.
11. Examine caliper housing for wear, pitting, particularly in 'O' ring groove. If badly worn, replace housing.
12. Replace individual parts, piston, 'O' ring and boot as required.
13. Re-assemble, installing brake stator, spacer and bolt, Tighten bolts to 12 foot pounds.
14. Remount caliper assembly in vehicle with new clips on both sides of housing flange. Tighten clip mount bolts to 30 foot pounds, bend clip tabs up to prevent loosening. Note orientation of caliper center line 'A' to park brake lever 'B' center line. Be sure friction material is facing the disc.
15. Rotate disc to be sure there is running clearance.
16. Re-connect hydraulic lines and park brake rods.
17. Bleed brake system and adjust hand park brake with clevis. Bleed air from brake system. See Section 12, page 4.

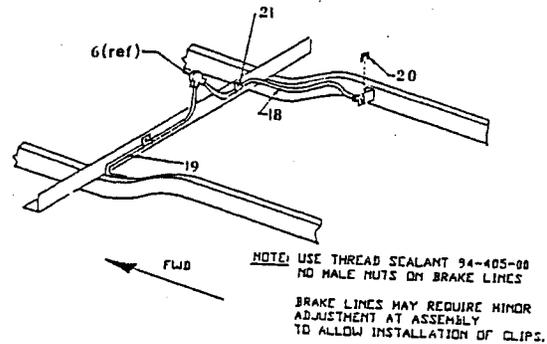
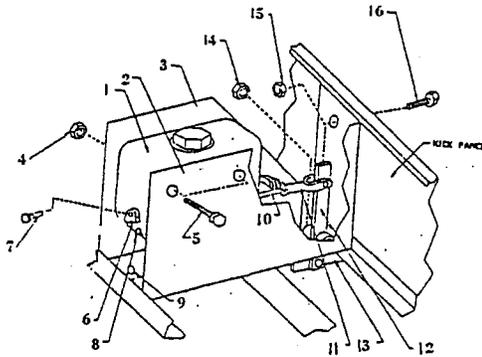
\* **NOTE:** Apply thin layer of grease to pin before installing. In corrosive environment, pin could lock up if not lubricated ie, near ocean or chemical plants.



HYDRAULIC DISC BRAKES

ITEM NO.	PART NO.	DESCRIPTION	QTY. REQ.
1.	88-067-21	1/4 NC Hex Head Bolt, Gr. 8	4
2.	88-069-82	Nut, Hex Lock, 1/4 NC HT Gr. 8	4
3.	41-348-52	Spacer, Mech, Disc. Brake	4
4.	41-350-51	Plate, Secondary, Hydraulic Disc	2
5.	41-350-52	Pin, Clevis, Hydraulic Disc Brake	2
6.	41-348-56	Pin, Hitch, Mechanical Disc Brake	2
7.	88-100-00	Washer, 11/32 ID x .110 Thick	4
8.	41-350-54	Pin, Park Brake	2
9.	41-350-53	Arm, Park Brake	2
10.	41-350-66	Kit, Cylinder Repair	4
11.	41-348-70	Pad, Disc Brake	4
12.	41-350-04	Hardware, Park Brake, Hydraulic Disc	2
13.	41-350-08	Bracket, Hydraulic Disc Body Large Bearing	2
14.	41-350-02	Fittings, Brake, Hydraulic Disc	2
15.	41-350-05	Clip, 2 hole W/Tab, Large Bearing	8
16.	96-328-00	Bolt, 3/8 x 5/8 NC Special Head Gr. 5	8
17.	41-350-18	Body, Hydraulic Disc Brake L.H.	2
	41-350-19	Body, Hydraulic Disc Brake R.H.	
18.	99-580-00	Hydraulic Hose	2
19.	* 99-582-00	Screw, Bleeder	2
20.	* 99-852-01	Adapter, Threaded	2
21.	* 41-886-00	Plug, Hex Socket	2
22.	41-350-12	Bracket, Lever	2

\* NOTE: For Replacement, order Item 14



MASTER CYLINDER  
(UNDER DRIVER'S SEAT)

HYDRAULIC BRAKE LINES  
(TO REAR DISC BRAKES)

HYDRAULIC DISC BRAKES

ITEM NO.	PART NO.	DESCRIPTION	QTY. REQ.
1.	99-510-01	Master Cylinder	1
2.	00-380-79	Weldment, Plate, Master Cylinder	1
3.	01-380-76	Plate, Support, Master Cylinder	1
4.	88-089-81	Locknut, 5/16	2
5.	88-080-20	Bolt, 5/16 x 3 Hex Head	2
6.	99-565-00	Y Fitting	1
	99-571-00	Washer, Wagner #FC602	1
	99-579-00	Bolt, Wagner #FC673	1
7.	99-598-00	Fitting, 3/16 Tube Seat Plug	1
8.	88-080-09	Screw, 5/16 x 3/4 Hex Head	2
9.	88-089-81	Locknut, 5/16	2
10.	50-010-00	Rod, Master Cylinder, 5/16 x 4-1/2	1
11.	96-763-00	Clevis, 5/16	1
	96-773-00	Pin, Clevis, 5/16	1
	88-517-09	Pin, Cotter, 3/32 x 3/4	1
12.	00-380-78	Bellcrank With Bushing	1
13.	00-380-80	Weldment, Brake Rod, Hydraulic	1
14.	88-149-81	Locknut, 1/2	1
15.	88-089-81	Locknut, 5/16	2
16.	88-080-09	Screw, 5/16 x 3/4 Hex Head	2
18.	99-604-58	Brake Line, Formed, Right Hand	1
19.	99-604-59	Brake Line, Formed, Left Hand	1
20.	99-576-00	Clip	2
21.	96-624-00	Wire Clamp	2
with	88-737-08	Rivet, 3/16 x 5/8	2
	94-405-00	Thread Sealant	1

MOTOR MAINTENANCE, SERVICE AND ADJUSTMENT ELECTRIC MOTORS  
REFER TO FIGURES IN THIS SECTION

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 proper equipment. Should it be necessary for you to order replacement parts for your motor, IT IS NECESSARY TO INCLUDE COMPLETE NAMEPLATE DATA WITH ORDER.

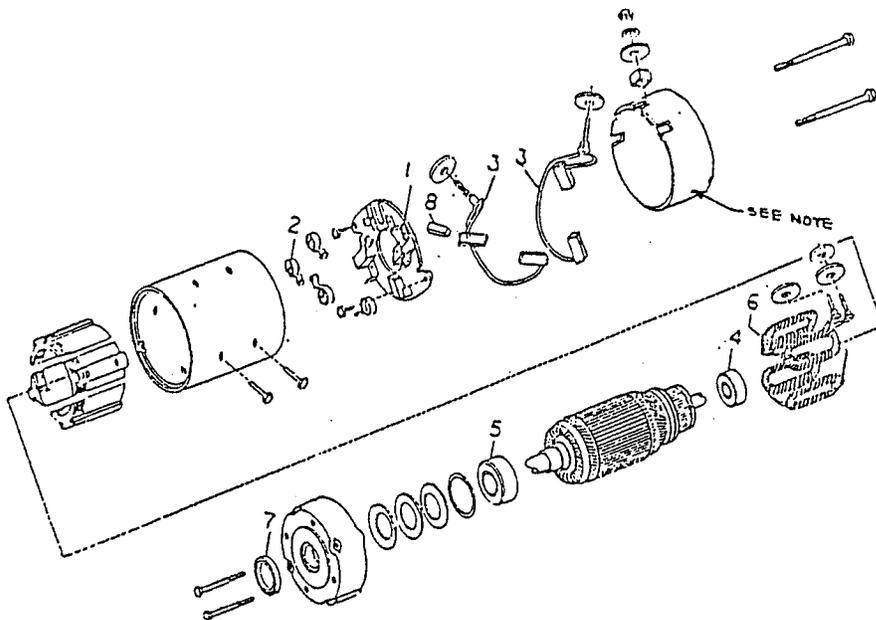
MOTOR MAINTENANCE - BRUSH INSPECTION AND REPLACEMENT

1. With new brushes, see not on G.E. drawing, page 2 this section.
  2. If brushes are worn, remove motor from vehicle and remove motor and bell for access to brushes. Install new brushes. Use fine sandpaper to 'seat in' new brushes to commutator. To verify when to replace worn brushes, proceed as follows:
    - a. For motors equipped with brushes having end pigtailed and side hooks, replace brush when hook is within 1/16" from bottom of hook slot.
    - b. For motors equipped with brushes having side pigtailed 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 motor end, reinstall in vehicle.

MOTOR DISASSEMBLY AND REASSEMBLY

1. Remove motor from vehicle as described in Section 11.
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 on to 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 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 end bell.
13. Re-assemble to vehicle as described in preceding subsection.

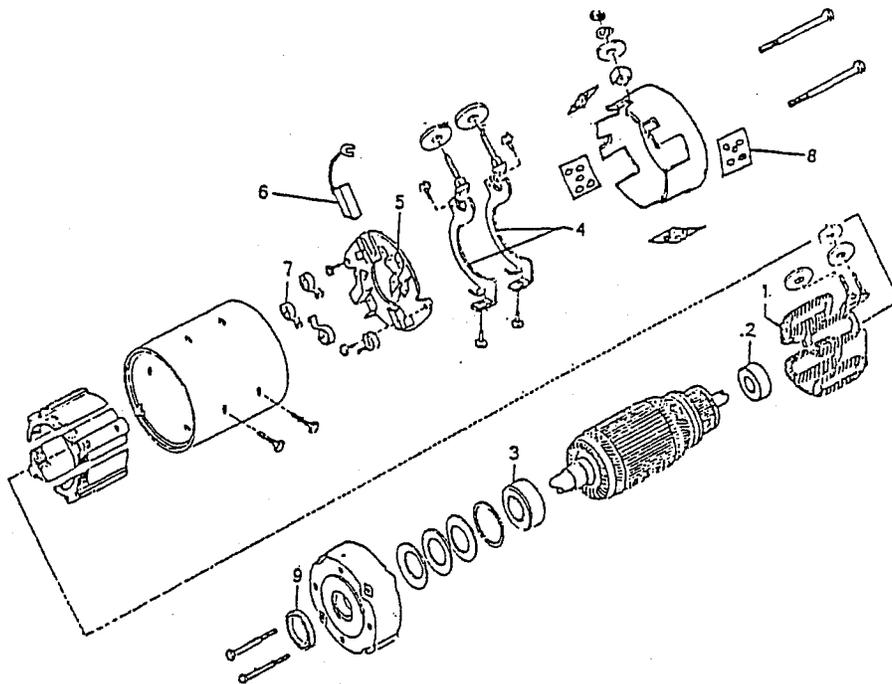
NOTE: If motor terminal studs were removed for inspection, refer to Section 11, page 3, for correct procedure to avoid damaging studs.



NOTE: Brush measurement holes (2). With new brushes a 1/16" drill rod can be inserted approximately .780" into the brush measurement holes. Brushes should be replaced when rod can be inserted 1.560" into hole. This leaves approximately 1/8" wear remaining.

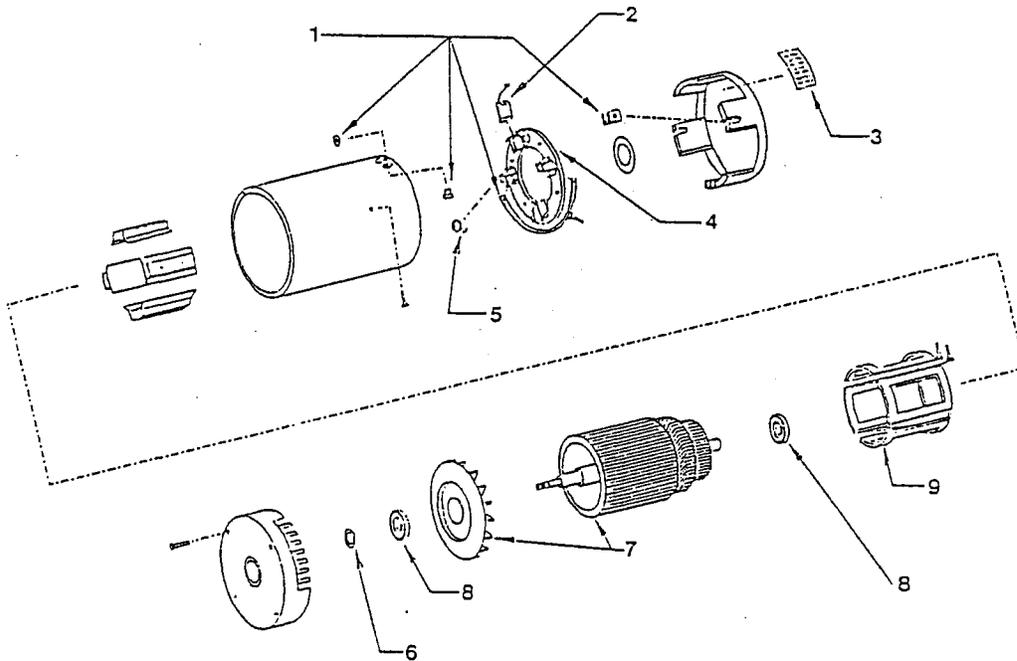
D. C. MOTOR

ITEM	PART NO.	DESCRIPTION	QTY.
	70-049-00	D.C. Motor 6.0 H.P. GE5BC48JE754	1
1.	70-172-00	Brush Holder Assembly (without brushes)	1
2.	85-412-00	Spring, Brush Extension	4
3.	70-104-00	Brush Assembly	2
4.	80-200-00	Ball Bearing, Commutator End	1
5.	80-504-00	Ball Bearing, Pulley End	1
6.	70-205-00	Field Coil Set	1
7.	45-506-00	Oil Seal	1
8.	70-250-00	Gasket, Terminal	4



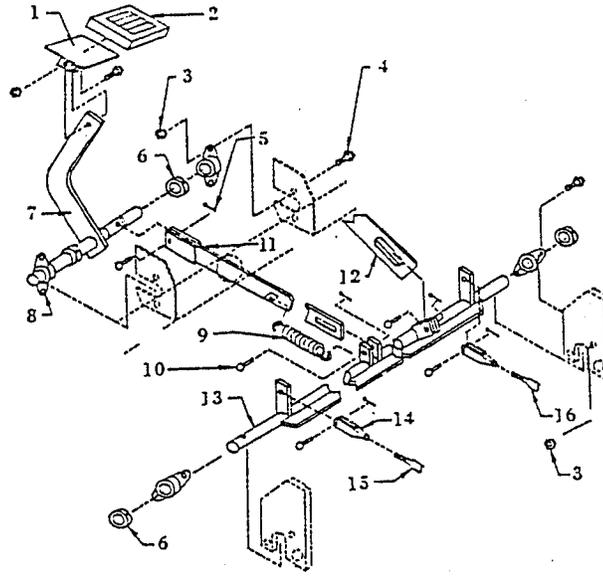
D. C. MOTOR

ITEM	PART NO.	DESCRIPTION	QTY.
	70-054-00	D. C. Motor 10.0 H.P. G.E. 5BC49JB399	1
1.	70-203-10	Field Coil Set	1
2.	80-200-00	Ball Bearing, Commutator End	1
3.	80-504-00	Ball Bearing, Pulley End	1
4.	70-195-10	Armature Terminal to Brush	2
5.	70-188-00	Brush Holder Assembly	1
6.	70-105-00	Motor Brush	4
7.	85-412-00	Brush Extension Spring	4
8.	30-802-00	Brush Extension Cover	4
9.	45-508-00	Oil Seal	1
10.	70-210-62	Motor Terminals Insulator Kit	1



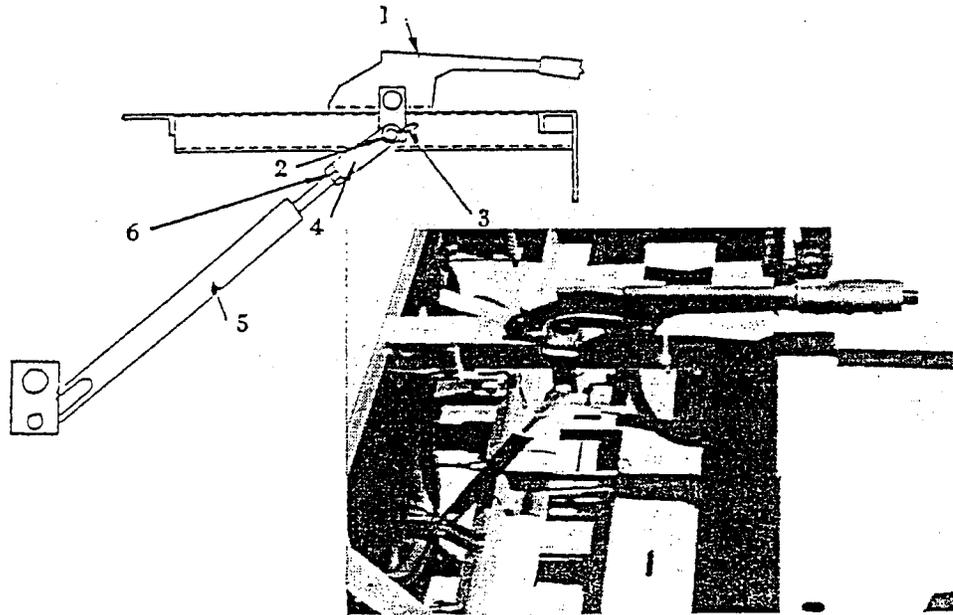
D.C. MOTOR

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	70-054-30	D.C Motor 10 HP Prestolite MVB 4001	
1	70-210-65	Kit Term Stud	4
2	70-105-10	Brush 10 HP Prestolite	4
3	30-802-20	Cover, Brush Inspection	4
4	70-188-10	Assembly, Brush Holder w/o Brushes or Springs	1
5	85-412-10	Spring, Brush 10 HP Prestolite	4
6	45-508-20	Seal, 10 HP Prestolite	1
7	70-054-31	Armature, w/Fan, 10 HP Prestolite	1
8	80-504-20	Bearing, Ball, Commutator and Pulley	2
9	70-203-20	Field Coils (set)	1



CONTROL LINKAGE

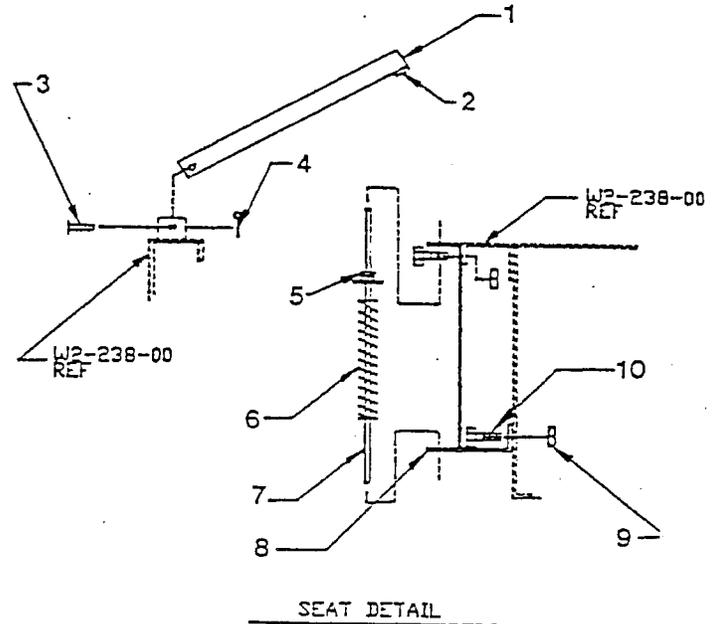
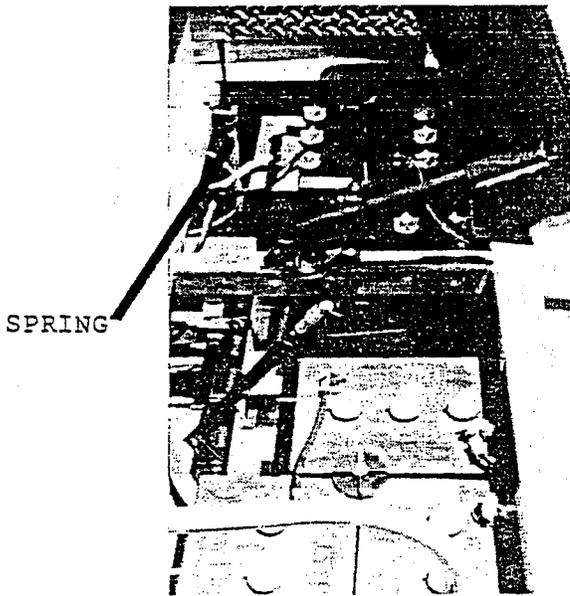
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	00-380-66	Weldment, Foot Brake	1
2.	98-200-00	Pad, Rubber Brake Pedal	1
3.	88-109-87	Nut, KEPS 3/8	9
4.	88-100-09	Screw, 3/8 x 3/4 NC Hex Head	9
5.	88-517-09	Pin, Cotter 3/32 x 3/4	5
6.	17-110-00	Collar, 3/4 Shaft	4
7.	02-380-39	Weldment, Service Brake	1
8.	80-410-20	Bearing, 2 Bolt Flange, Brake	4
9.	85-233-00	Spring, Ext., Accelerator	1
10.	96-773-00	Pin, Clevis 5/16 x 1	5
11.	02-380-40	Weldment, Brake Rod (Mechanical Disc)	1
	00-380-80	Weldment, Brake Rod (Hydraulic Disc)	1
12.	01-380-62	(See Sec. 14 Pg. 2) Weldment Linkage, Handbrake	1
13.	01-386-23	Weldment, Shaft, Main Brake	1
14.	96-763-00	Clevis, 5/16 Inch	2
15.	00-380-81	Assembly, Link (Brake) Adjust LH	1
16.	00-380-82	Assembly, Link (Brake) Adjust RH	1



CONTROL LINKAGE  
(HAND, PARK BRAKE)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	51-343-00	Hand, Park Brake	1
2.	96-773-00	Pin, Clevis	1
3.	88-517-06	Cotter Pin	1
4.	96-763-00	Clevis	1
5.	01-380-62	Linkage, Handbrake	1
6.	88-099-80	5/16 NF Hex Head Nut	1

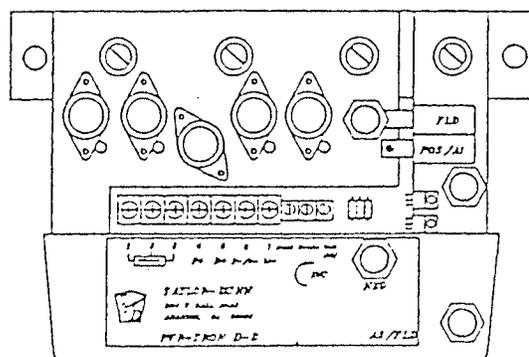
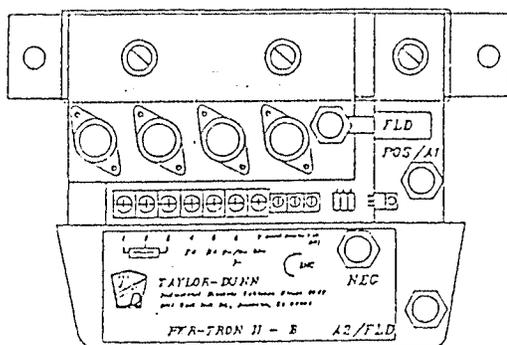
See Item 12, Page 1 of SECTION 14 for linkage mounting



ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	00-380-48	Weldment, Seat Base	1
2	98-451-11	Tape, Seal 1 X 3/8 X 10 Inches Long	1
3	97-773-00	Pin, Clevis 5/16 X 1 Inch Long	2
4	88-517-09	Pin, Cotter 3/32 X 3/4 Inches Long	2
5	98-603-00	Grommet, Rubber, 3//8 Inches ID	1
6	85-123-10	Spring, Deadman Seat, 10 Inches Long	1
7	00-380-41	Assembly, Rod Seat Spring	1
8	00-380-75	Weldment, Mount Seat Spring	1
9	88-069-81	Locknut, 1/4 NC	2
10	88-060-06	Screw, HX Head Cap, 1/4 NC x 1/2	2

PWR-TRON II INTRODUCTION

The PWR-TRON II is developed and available only from Taylor-Dunn and is warranted for one full year. Modifications to the control unit, drive or power system will void the warranty.



PT 220 (STANDARD)

24 OR 36 VOLTS  
RECOMMENDED FOR  
USE UP TO 6 HP  
MOTORS.  
(INTERMITTENT)

PT 290

24 OR 36 VOLTS  
RECOMMENDED FOR  
USE UP TO 10 HP  
MOTORS.  
(INTERMITTENT)

INTRODUCTION

PWR-TRON II transistorized control is a solid state voltage regulator designed specifically for use on electric vehicles. Its essential function is to regulate the power fed from battery to motor so as to provide full control of the vehicle speed under all operating conditions.

The PWR-TRON II unit is connected in between the motor and the battery. Power feed to the motor is regulated by switching the motor on and off at high speed. By adjusting the ON time with respect to the OFF time the average voltage applied to the motor can be varied. This switching is done using power transistors.

PWR-TRON II ELECTRIC VEHICLE CONTROL

FEATURES

**Current Limit** - Cold current limit is 220A, for type B, 290A for type D.

**Thermal Roll-Back** - Continuous overloading will reduce the current limit progressively above 150 degrees F (65 degrees C).

**Acceleration Limit** - Built in acceleration ramp to prevent jack-rabbit starts (can be factory set for various applications, or may be adjustable).

**Automatic Plug Braking** - Built in plugging control to give smooth reversals and prevent operator injury or equipment damage with inadvertent direction changes.

**Bypass Enables and Time Delay** - Built in circuitry give on-demand bypass (1A) facility and plugging hold-off.

**Special Feature** - Faulty transistor detection helps prevent vehicle runaway or dangerous starts.

**Add-on Protection** - Suppression diodes for the Forward/Reverse and By-pass Contactor Coils are incorporated in the PWR-TRON II unit. If the vehicle has other contactors for power steering, pumps, etc., these coils must also be suppressed by fitting a diode across them.

The PWR-TRON II unit may have a number of adjustments enabling a control to be custom set for a particular installation. The adjustments do not override any of the safety functions, hence the control unit will not be damaged by incorrect setting of the following functions:

**Acceleration** - The rate of acceleration can be preset by means of the ACCEL trimpot on the logic. This cannot be overridden by rapid depression of the accelerator.

**Brake** - The brake control adjusts the deceleration rate in the plug braking mode. As protection to the motor and other electrical devices, the braking effect is kept low. The vehicle should be stopped using the service brake.

**Volts Adjust/Low Speed** - This trimmer is used to adjust for different supply voltages and when incorrectly set, will cause a delay between the operation of the accelerator and the movement of the vehicle and may cause instability during plug braking mode.

GENERAL

The PWR-TRON unit is readily accessible under the deckboard. The PWR-TRON unit performs two functions; power control for speed and acceleration rate control for smooth operation. The PWR-TRON unit is a transistorized supply that regulates the voltage from the battery. An accelerator module provides a signal to the PWR-TRON proportional to the desired power output of the control. This gives the operator full control of the vehicle power and speed.

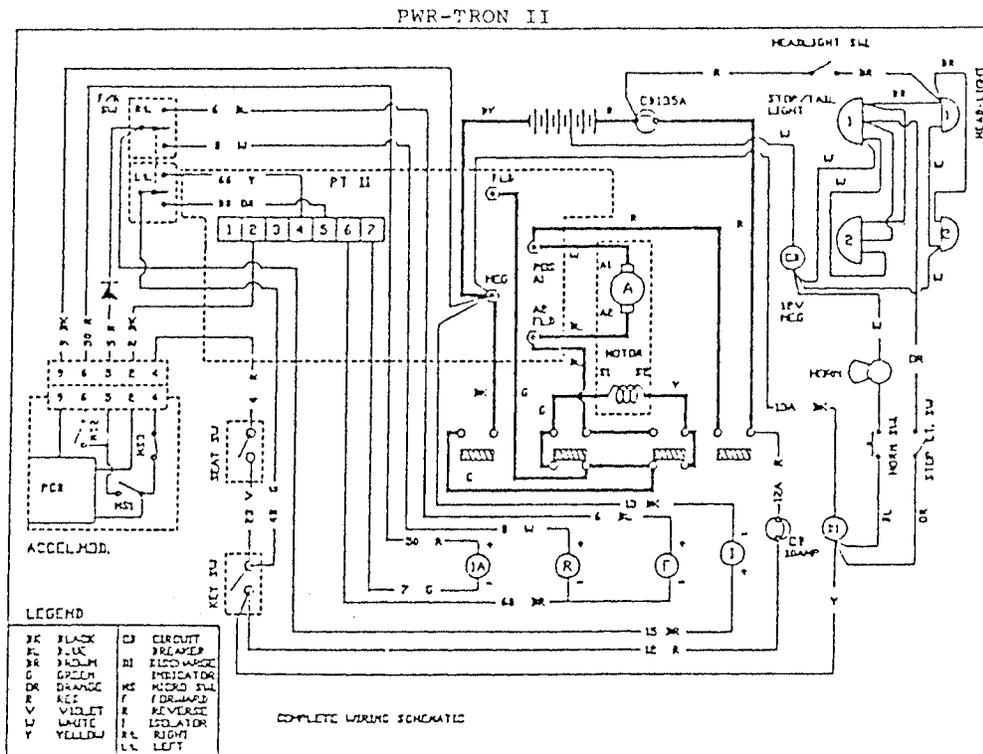


Figure 1

**CIRCUITRY AND OPERATION**

There are two circuits included in the operation of the PWR-TRON II, the control circuit and the power circuit.

The control circuit (light gauge wire) includes: key switch, seat switch, MS-1; activated by the accelerator module, the PWR-TRON solid state controller, forward-reverse switch and solenoid panel.

The power circuit (heavy gauge wire) includes the batteries, forward reverse switch and motor.

**CONTROL CIRCUIT (See Figure 1, Shown in light lines) Control Harness 75-146-21**

Forward Operation. 1) Turn key to "ON" position and move forward-reverse switch to forward position. 2) As the accelerator is depressed, a cam, MS1 closes providing a current path to the forward solenoid coil and closing forward contact on the forward-reverse switch. 3) The magnetic sensor on the PCB board will increase the PWR-TRON signal voltage moving vehicle forward reverse operation. As the accelerator is depressed, a cam on the PCB board will increase the voltage, moving the vehicle forward.

Reverse Operation. 1) Turn key to "ON" position and move forward-reverse switch to reverse position. 2) As the accelerator is depressed, a cam, MS1 closes providing a current path to the reverse solenoid coil and closing reverse contact on the forward-reverse switch. 3) The magnetic sensor on the PCB board will increase the PWR-TRON signal voltage moving vehicle forward reverse operation. As the accelerator is depressed, a cam on the PCB board will increase the voltage, moving the vehicle in reverse.

PWR-TRON II

POWER CIRCUIT (See Figure 1, Shown in Heavy lines) Power Harness 75-147-21

Forward Operation. When the control circuit is energized and the isolator and forward solenoid contacts are closed current flow is then channeled through the PWR-TRON II and then to the power wiring. Motor speed is controlled by voltage output from the PWR-TRON II.

Reverse Operation. The same circuit is used as forward operation except the reverse solenoids contact (not forward) is closed to reverse current flow through the motor.

When the accelerator is fully depressed, a microswitch (MS-2) is closed which activates the bypass solenoid (1A). This provides full battery potential to the motor.

OPERATING YOUR PWR-TRON II

To put your vehicle into operation, turn ignition key to "ON". Select direction you wish to travel by moving forward/reverse switch to desired position. Release parking brake, slowly depress accelerator pedal until 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 PWR-TRON II speed control, avoiding "jack-rabbit" starts.

"Plug braking" is an additional feature of the PWR-TRON. It is a safety feature that makes it unnecessary to come to a complete stop before reversing the vehicle. When reversed, the vehicle will automatically slow to a stop and reverse itself to full acceleration. This maneuver does no damage to the PWR-TRON II. However, stopping the vehicle should be done with the service brake. Also, it is recommended when starting the vehicle to be sure to always turn ignition key on first then select direction of travel with the forward-reverse switch, before depressing the accelerator pedal.

PWR-TRON II PREVENTIVE MAINTENANCE

**WARNING:** BEFORE WORKING ON THE PWR-TRON UNITS OR ANY PART OF THE VEHICLE SYSTEM, DISCONNECT BOTH THE MAIN POSITIVE AND NEGATIVE BATTERY LEADS. PLACE THE FORWARD-REVERSE LEVER IN NEUTRAL, TURN OFF AND REMOVE KEY. ALWAYS SET PARKING BRAKE.

\* No regular maintenance is required.

Be sure ignition key is on before depressing accelerator pedal. DO NOT depress pedal then turn on key. This is unsafe operation.

**CAUTION:**

Do not steam clean or spray with water.

Make sure all wire connections are secure.

There are three modules as part of this system, solenoid panel, accelerator module and PWR-TRON II module. These are all easily removable for replacement and service.

Only qualified service personnel should perform any replacement, adjustments or servicing of the PWR-TRON II module, solenoid panel or the accelerator module. This will avoid the possibility of voiding your warranty on the PWR-TRON

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

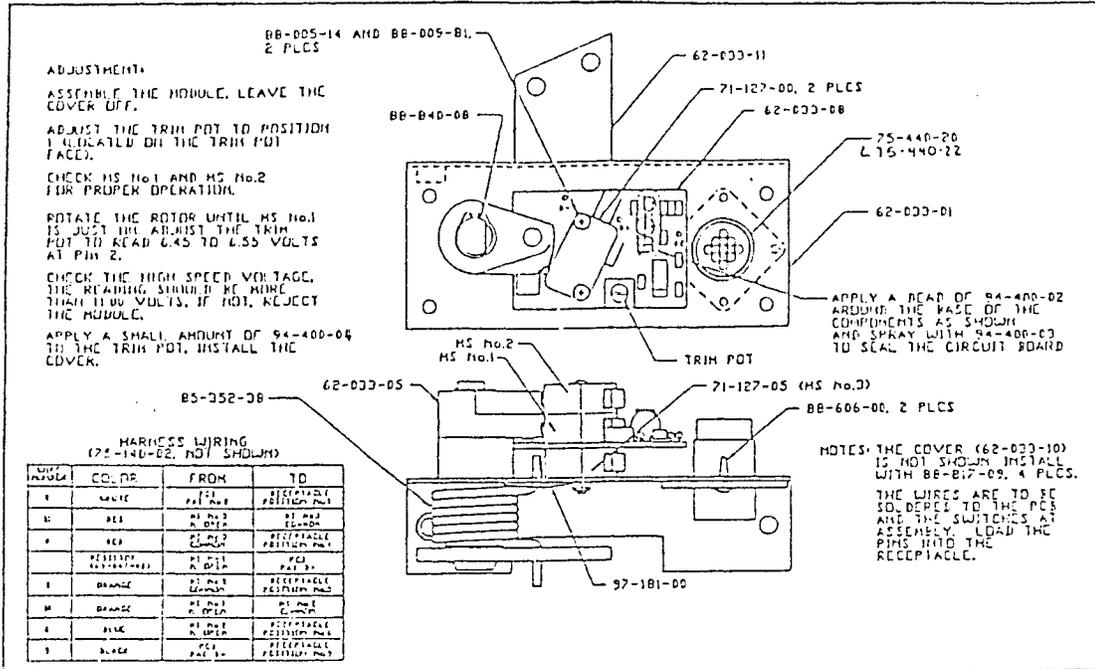
1. REPAIR OR REPLACEMENT OF INDIVIDUAL COMPONENTS

If replacement of semi-conductors, i.e. transistors becomes necessary, the following points must be rigidly adhered. The serviceman is advised that in the event of uncertainty over repair procedures, it is better to change the complete control unit, rather than risk further damage with an improper repair.

- (a) Transistors - These are available as a factory approved spare consisting of a matched set of transistors. Only factory approved spares must be used. Replacement of individual transistors invalidates warranty.
- (b) Insulation - The wire insulation material (fiberglass reinforced teflon) must be kept absolutely clean. The electrical isolation between heatsink and baseplate must be checked with an Ohm meter after assembly. Check that the resistance is greater than 1 Megohm (1,000,000 Ohms).
- (c) Wiring - The positions of all wires and lugs should be noted and marked prior to removal so that there is no confusion on re-assembly.
- (d) Component Polarity - Transistors can be damaged by quite modest currents incorrectly applied and are destroyed by reverse currents. If replacing transistors, ensure that polarity is correct.
- (e) Connections - Check all connections for tightness on completion.
- (f) Final Checks - Prior to the first switch on, check battery polarity. Use test light to ensure safety.

\* **NOTE:** Any controllers that will be used in ambient temperature above 104 degrees F or 40 degrees C should be brought to the attention of the truck manufacturer.

ACCELERATOR MODULE



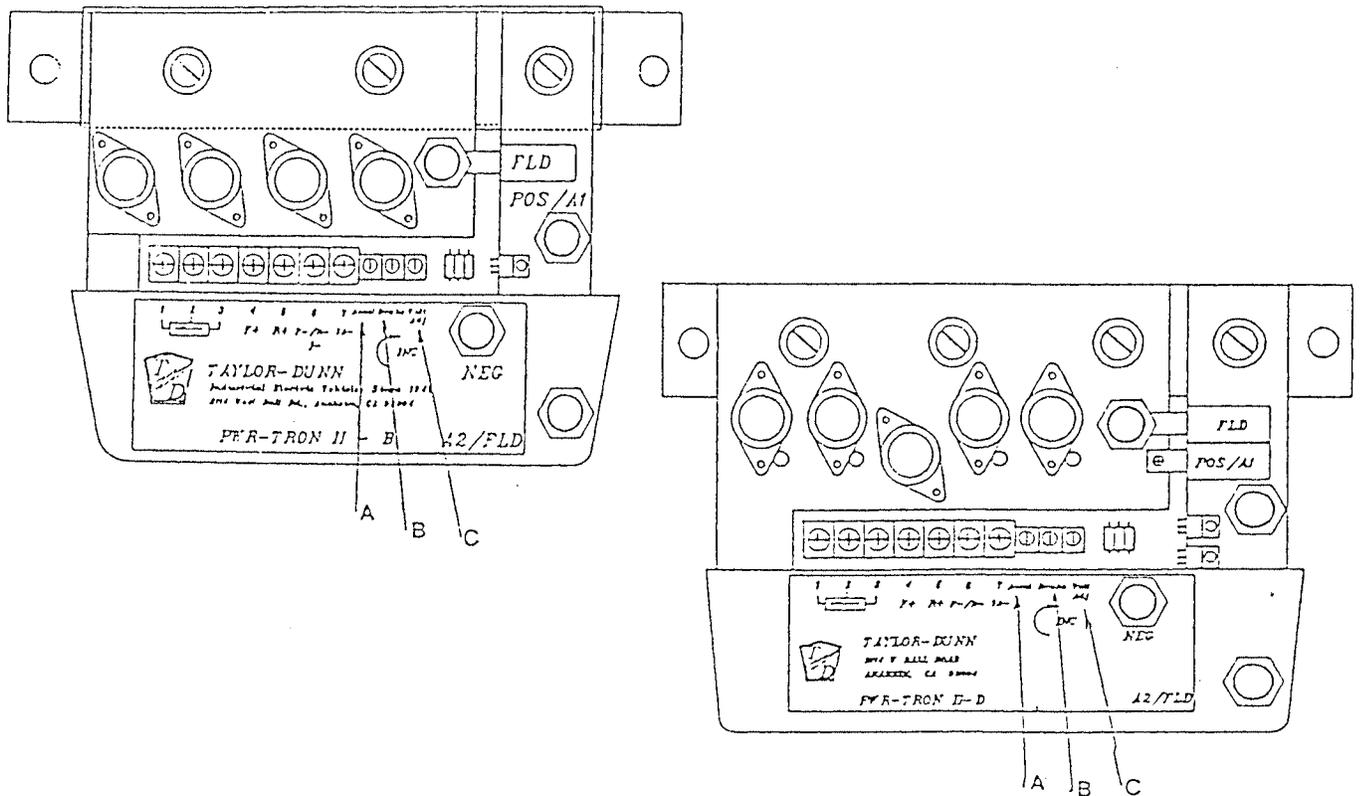
ACCELERATOR MODULE  
FIGURE 2

GENERAL FEATURES

This item is a solid state module, factory adjusted. The accelerator mounts directly to the accelerator pedal eliminating the need for any intermediate linkage. Should it become necessary to adjust the solid state accelerator, remove the accelerator from the vehicle.

Double Check Battery Polarity Severe damage will result if the battery polarity is reversed.

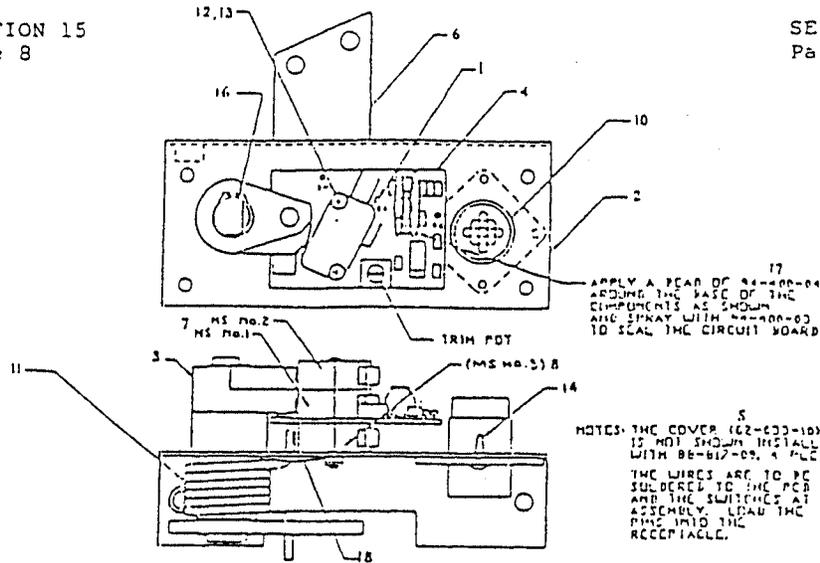
It is always good practice to use the test light (part number 62-027-00) in series with the motor, prior to initial turn on. This will indicate any abnormalities in the control.



PWR-TRON II TRIMPOT ADJUSTMENTS

- A. ACCELERATOR - Turn full direction of arrow
- B. BRAKE - Turn full opposite direction of arrow to start. Turn up 1/4 in direction of arrow.
- C. VOLTS ADJUST - Adjust trimpot so motor whines but does not turn when accelerator switch is first closed.

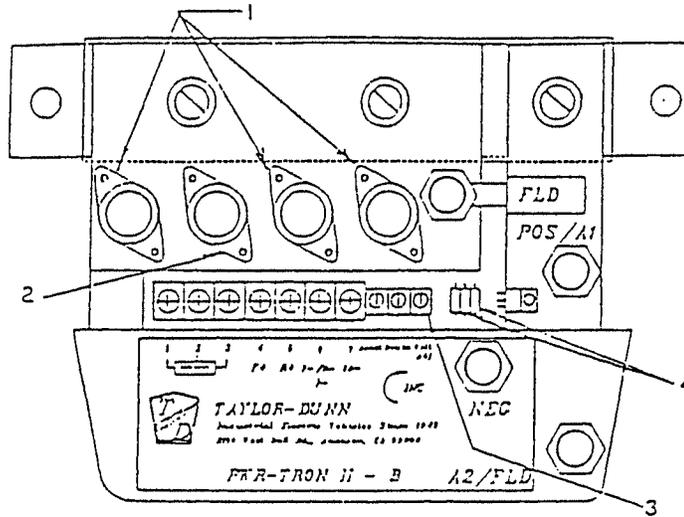
AFTER ALL POTS HAVE BEEN FINAL ADJUSTED, COAT POTS WITH WHITE SILICONE SEALANT.



HARNES WIRING - 9 (75-140-02, NOT SHOWN)

WIRE NUMBER	COLOR	FROM	TO
2	WHITE	PCB PAD NO. 2	RECEPTACLE POSITION NO. 2
11	RED	MS NO. 3 N. OPEN	MS NO. 1 COMMON
4	RED	MS NO. 3 COMMON	RECEPTACLE POSITION NO. 4
	RESISTOR (69-047-01)	MS NO. 1 COMMON	PCB PAD B+
5	ORANGE	MS NO. 2 COMMON	RECEPTACLE POSITION NO. 5
10	ORANGE	MS NO. 1 N. OPEN	MS NO. 2 COMMON
6	BLUE	MS NO. 2 N. OPEN	RECEPTACLE POSITION NO. 6
9	BLACK	PCB PAD B-	RECEPTACLE POSITION NO. 9

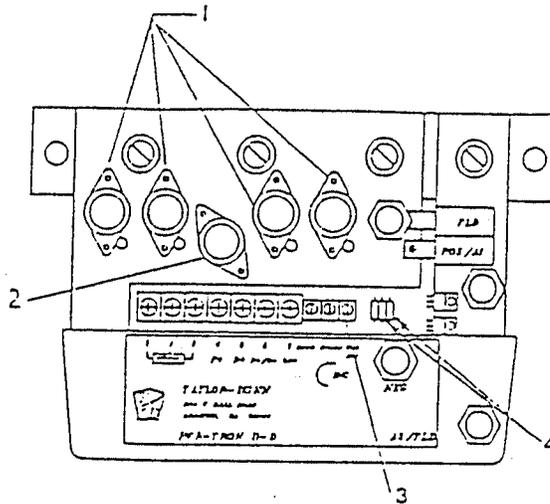
FIG ID	T-D PART	DESCRIPTION	QTY.
1.	69-047-01	RESISTOR 47 OHMS, 1 WATT	1
2.	62-033-01	ASSEMBLY, BACKING PLATE	1
3.	62-C33-05	ASSEMBLY, CAM W/MAGNET	1
4.	62-033-08	PCB WITH COMPONENTS	1
5.	62-033-10	COVER, SOLID STATE ACCELERATOR (NOT SHOWN)	1
6.	62-033-11	WELDMENT, ROTOR, SOLID STATE ACCELERATOR	1
7.	71-127-00	SW, SNAP ACTION MINIATURE	2
8.	71-127-05	SWT. SNAP ACTION, SHORT LEVER	1
9.	75-140-02	HARNES, SOLID STATE AC	1
10.	75-440-20	RECEPTACLE, SQUARE FLANGE, 9	1
11.	65-352-38	SPRING, TORSION, SOLID STATE	1
12.	65-005-14	4-40 X 1-1/2 MACHINE SCREW	2
13.	65-009-81	4-40 LOCK NUT	2
14.	66-606-03	CLIP, CANOE, .125 X .16 GRIP	2
15.	88-817-09	#8 X 3/4 PAN HEAD SCREW (FOR COVER MOUNTING)	4
16.	88-840-08	RING SNAP 1/2 EXT	1
17.	94-400-02	SEALANT, SILICONE, BLACK	1
18.	97-181-00	WASHER, 22 GA SST .141 X .875	1
--	75-440-21	PLUG	



PARTS LIST

PWR-TRON II MODEL 220 PART NO. 62-022-00

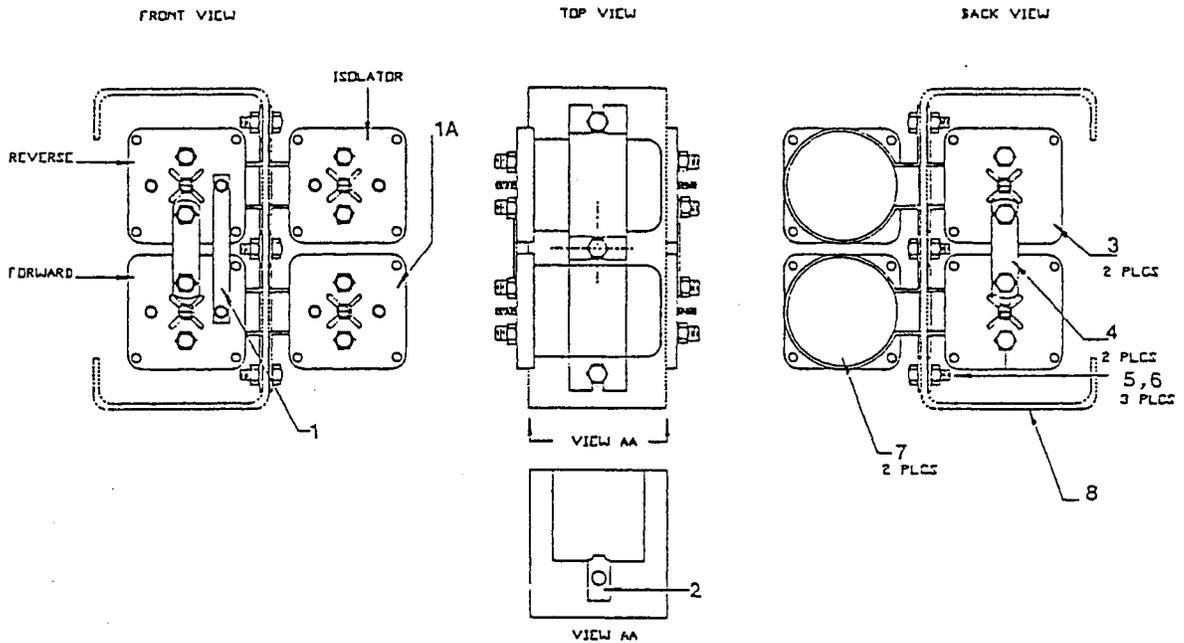
FIG. ID	T-D PART	DESCRIPTION	QTY.
1	62-022-32	POWER TRANSISTORS (3)	1 (SET)
2	62-022-31	DRIVER TRANSISTOR	1
3	69-020-30	TRIMPOT, 20K OHM (3/8 SQUARE)	3
4	69-056-92	RESISTOR, 5.6 OHM, 1/2 WATT (2)	1 (SET)



PARTS LIST

PWR-TRON II MODEL 290, PART NO. 62-029-00

FIG.ID	T-D PART	DESCRIPTION	QTY.
1	62-029-32	POWER TRANSISTORS (4)	1 (SET)
2	62-029-31	DRIVER TRANSISTORS	1
3	69-029-31	TRIMPOT, 20 K OHM (3/8 SQUARE)	3
4	69-056-92	RESISTOR, 5.6 OHM 1/2 WATT (2)	1 (SET)



36 VOLT SOLENOID PANEL ASSEMBLY

PART NO. 72-560-32

PARTS LIST

FIG. ID	T-D PART	DESCRIPTION	QTY.
1	61-838-32	BUS-BAR, 3/8 X 3-5/8	1
2	97-213-00	CLIP, 11/16 TINNEMAN	1
3	72-501-39	SOLENOID, SPDT 36 VOLT 200 AMP	2
4	61-838-30	BUS-BAR 5/8 X 2-1/2	2
5	88-060-11	1/4 X 1 NC HEX HEAD CAP SCREW	3
6	88-069-87	1/4 NC HEX HEAD KEPS NUT	3
7	72-501-38	SOLENOID, SPST 36 VOLT 200 AMP	2
8	72-560-53	PANEL, SEALED SOLENOID	1
*	75-235-25	JUMPER (A TO B) 6 GA., 5 INCHES LONG	1
*	75-235-29	JUMPER (C TO D) 6 GA., 9 INCHES LONG	1

\* NOTE: JUMPERS NOT SHOWN

PWR-TRON II  
TROUBLE SHOOTING

Before proceeding with any trouble shooting, read the manual; understand the basic principles of operation and be familiar with component testing and replacement procedures. The PWR-TRON II controller, when operating correctly, will emit a clear whistle, the frequency of which is related to the frequency of the ON/OFF chopper action. The pulsing of the equipment is too fast to measure with conventional equipment and the following fault procedure is based on the use of simple tools.

TOOLS AND EQUIPMENT REQUIRED

- (a) Test light, part number 62-027-00
- (b) Clip leads.
- (c) Multimeter

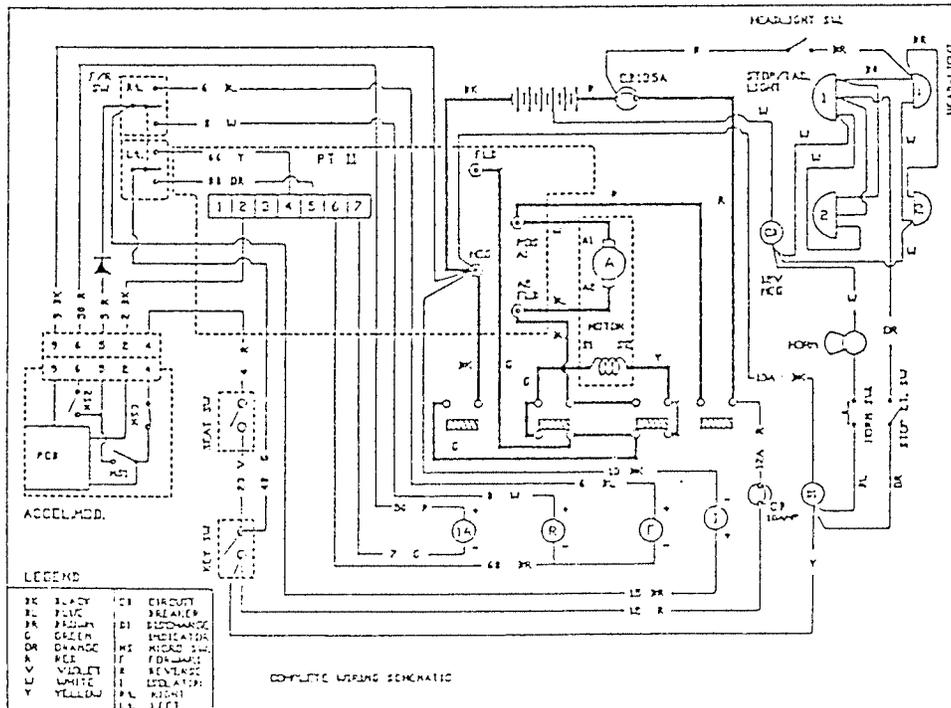
PHYSICAL INSPECTION

Check controller for physical damage, loose or broken wiring, evidence of component overheating, etc. Pay particular attention to adjustment of accelerator switch and potentiometer operation.

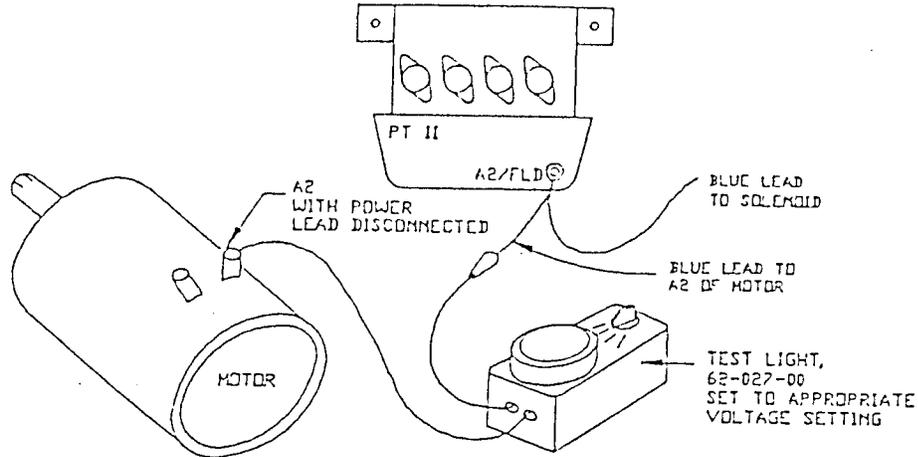
Prior to touching any electrical components DISCONNECT BATTERY AND CONNECT TEST LIGHT IN SERIES WITH MOTOR ARMATURE. (See Continuity & Power Check next page).

Reconnect battery as needed for carrying out any specific tests.

PWR-TRON II SCHEMATIC



PWR-TRON II



CONTINUITY AND POWER CHECK

NOTE: VEHICLE DRIVE WHEELS MUST BE JACKED UP OFF THE FLOOR FOR THE FOLLOWING TEST.

CAUTION: THIS IS A FACTORY CHECKOUT PROCEDURE AND SHOULD ONLY BE MADE BY A QUALIFIED MECHANIC.

After the PWR-TRON II system has been installed, a preliminary power check is required, prior to fine tuning of the PWR-TRON. The vehicle should be ready for basic operation at this time.

Lift blue lead at A2 on motor (refer to Figure 1) and place test light in series with A2/FLD pole on PWR-TRON II. Place forward/reverse switch in forward. Initiate accelerator slowly, light should come up to maximum brilliance at full acceleration. Repeat same step for reverse. If problems are encountered, see "Trouble Shooting" in this section. Also check acceleration rate by quickly depressing accelerator full. Light should come to full brilliance in 3 seconds. (CAUTION, do not perform plugging with light attached).

When both steps are completed satisfactorily, place vehicle on floor, prepared for operation and fine tuning of the PWR-TRON II unit. Proceed to the page on "Trimpot Adjustment".

PWR-TRON II  
TROUBLE SHOOTING

<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
1. Vehicle will not reach full speed	Check that the accelerator is set up correctly and the voltage swing at logic pin 2 is correct (6.3 volts to 11 volts)  Check acceleration setting on PWR-TRON II.
2. Vibration or roughness when braking	Incorrectly adjusted BRAKE TRIMPOT. See Trimpot Adjust in this section.
3. Weak and uneven braking forward and reverse.	Incorrectly adjusted BRAKE TRIMPOT. See Trimpot Adjust in this section.
4. Very strong braking	Incorrectly adjusted BRAKE TRIMPOT. See Trimpot Adjust in this section.  Armature and Field connections interchanged.  Armature and Field cables not independently routed back to controller.
5. Strong braking on freshly charged battery	BRAKE TRIMPOT set too high.
6. Delay between operation of accelerator and motion of vehicle	CREEP TRIMPOT not set properly.
7. Vehicle accelerates when key switch is on. No accelerator movement is necessary	CREEP TRIMPOT not set properly.  Accelerator stop rest (mono directional) /center off rest position (Bi-directional) or linkages not correctly set up.  Microswitch in accelerator not adjusted correctly.

PWR-TRON II  
TROUBLE SHOOTING

LOW OR NO MOTOR TORQUE

NO TEST VOLTAGES, FIRST PLACE TEST LIGHT IN SERIES WITH THE MOTOR.

<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
1. Solenoids do not operate. No voltage at solenoid coils.	Check power and control fuses. Replace if defective. Check for power at both sides of key switch. Check for power at both sides of direction switch. Check for power at both sides of brake switch. Check for flat or reversed battery.
If there is voltage at requested solenoid coil.	Check that there is no short between FLD and NEG, e.g. shorted transistor, welded bypass contacts. Check that battery voltage is reaching terminals 4 (Forward), 5 (Reverse) as relevant.
2. Solenoid close. No power and no transistor whistle when speed is wound up.	Check circuit breaker. Battery voltage should appear at both ends of fuse. Check battery volts.  Check accelerator circuit and operation of speed pot - To do this, place test light in series with the armature and wind the speed up and down with accelerator pedal. The voltage at logic terminal 2 should move from 6.3 volts to 11 volts. If it stays at 6.3 volts the fault is in the accelerator wiring. If voltage stays high, accelerator may be bad or it has lost negative lead to battery.  Check motor circuit. If the voltage at FLD terminal is lower than B+ then examine the motor circuit for worn brushes, sticking brushes, loose cable connections, etc. Also low voltage may indicate loss across contactor (solenoid) tips. Check resistance.
3. Solenoids close, little or no power. High frequency whistle.	Check motor circuit for short circuits. Check for loose connections.  Check for interchanged armature and field connections.
4. Solenoids close. Vehicle accelerates to full speed but lacks power.	Check battery voltage under load. Check voltage on transistor heatsink, FLD. If low to full speed but lacks power (approx. 2 volts) when accelerating, check motor circuit. If high, check for loose connections.

PWF-TRON II  
TROUBLE SHOOTING

SYMPTOM

POSSIBLE CAUSE

FULL MOTOR TORQUE AVAILABLE - GENERAL FAULTS

TO TEST VOLTAGES, FIRST PLACE TEST LIGHT IN SERIES WITH ARMATURE.

- |                                                                             |                                                                                                                                           |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Solenoid closes and full speed.                                          | Check accelerator circuit and voltage at pin 2. Should swing from 6.3 to 11 Volts with depression of accelerator.                         |
| 2. Unequal braking in either direction, or unequal power in each direction. | Misadjusted motor brushes. Rotate brush gear to give equal braking in each direction.<br><br>Dirty or burned direction solenoid contacts. |

PWR-TRON II  
TROUBLE SHOOTING

STANDARD LOGIC VOLTAGES MEASURED WITH RESPECT TO B-  
TO TEST VOLTAGES, FIRST PLACE LIGHT BULB IN SERIES WITH ARMATURE.  
LOGIC TERMINAL

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>CONDITION</u>	<u>VOLTAGE*</u>
1.	Speed Pot Reference	Key switch open Key switch and solenoid closed	0V ~ 11V
2.	Speed Pot Signal	Key switch open Key and solenoid closed, slow speed Key and solenoid closed, fast speed	0V ~ 6.3 V ~ 11V
3.	Speed Pot Reference	Key switch open Key switch and solenoid closed	0V 6V
4.	Forward Solenoid Coil Positive	Key switch closed, forward selected Key switch closed, reverse selected	B+ ~ 0V
5.	Reverse Solenoid Coil Positive	Key switch closed, reverse selected Key switch closed, forward selected	B+ ~ 0V
6.	Forward/Reverse Solenoid Coil Negative	Key switch closed, direction not selected Key switch closed, direction selected. For <.5 sec., brief rise to After .5 sec., falls back to Key switch closed, direction selected. Faulty transistor	~ 0V ~ 7V ~ 0 E+
7.	Bypass Solenoid Coil Negative	Key switch & direction solenoid closed. Bypass requested Key switch & direction requested solenoid closed. ** Bypass requested for 3 secs. after 3 secs.	~ 0V E+ ~ 0V
NEG.	Battery Negative	All	0
POS/A1	Battery Positive	After key switch & solenoid closed	B+
A2/FLD	Armature & Forward/Reverse Solenoid Normally Closed	Key switch & solenoid closed - Vehicle at rest Key switch & solenoid closed - Vehicle at full speed	B+ ~ 2V
FLD	Field, i.e. Forward/Reverse Solenoid Normally Open	Key switch open Key switch closed and solenoid open	0V B+

\*B+ = Battery Positive - Voltages are measured with respect to Battery Negative.

\*\* = This delay is set by Acceleration Trimpot.

SUGGESTED SPARE PARTS

PWR-TRON II SPEED CONTROLLER SYSTEM

T-D PART NO.	DESCRIPTION	1-20 QTY. REQ.	21 - 50 QTY. REQ.	50 - UP QTY. REQ.
62-022-00	MODEL 220, PWR-TRON II	1	1	2
62-022-32	POWER TRANSISTOR (3)	1 SET	1 SET	2 SETS
62-022-31	DRIVER TRANSISTOR	1	1	2
62-020-30	TRIMPOT, 20 K OHM	3	3	6
69-065-92	RESISTOR, 5.6 OHM 1/2 W (2)	1 SET	1 SET	2 SETS
62-029-00	MODEL 290, PWR-TRON II	1	1	2
62-029-32	POWER TRANSISTORS (4)	1 SET	1 SET	2 SETS
69-029-31	DRIVER TRANSISTOR	1	1	2
69-029-31	TRIMPOT, 20 K OHM	3	3	6
69-056-92	RESISTOR, 5.6 OHM 1/2 W (2)	1 SET	1 SET	2 SETS
62-033-00	ACCELERATOR (SOLID STATE)	1	1	2
62-033-08	PCB W/COMPONENTS	1	1	2
62-033-10	COVER, ACCELERATOR	1	1	2
71-127-00	SWITCH, SNAP ACTION, MINIATURE	2	2	4
71-127-05	SWITCH, SNAP ACTION, SHORT LEVER	1	1	2
75-140-02	HARNES, SOLID STATE ACCELERATOR	1	1	2
88-006-00	CLIP, CANOE .125 X .16 GRIP	2	2	4
94-400-02	SEALANT, SILICONE, BLACK	1	1	2
72-560-32	36 VOLT SOLENOID PANEL ASSEMBLY	1	1	2
61-838-32	BUS BAR, 3/8 X 3-5/8	1	1	2
61-838-30	BUS BAR, 5/8 X 2-1/2	2	2	4
72-501-38	SOLENOID, SPST 36 VOLT 200 AMP	2	2	4
72-501-39	SOLENOID, SPDT 36 VOLT 200 AMP	2	2	4
75-235-35	JUMPER (A TO B) 5 IN. LONG	1	1	2
75-235-29	JUMPER (C TO D) 9 IN. LONG	1	1	2

NOTE: 72-560-32 IS ALSO USED IN THE RHEOSTAT SPEED CONTROL

MAINTENANCE PROCEDURES  
RHEOSTAT SPEED CONTROL

GENERAL FEATURES

The rheostat controls the speed of your vehicle through the use of coils of nichrome resistance wire. With this type of resistance control, you use approximately the same amount of power from batteries in low speed as you do in high speed. The flat copper bars and movable arm are the major parts in the rheostat. With recommended adjustment the rheostat will give many months of trouble free use. The space between bars should be cleaned with a piece of wood or plastic or steamed cleaned if possible on a monthly basis. When the arm is worn down to 1/8 " thickness, replace arm and power bars.

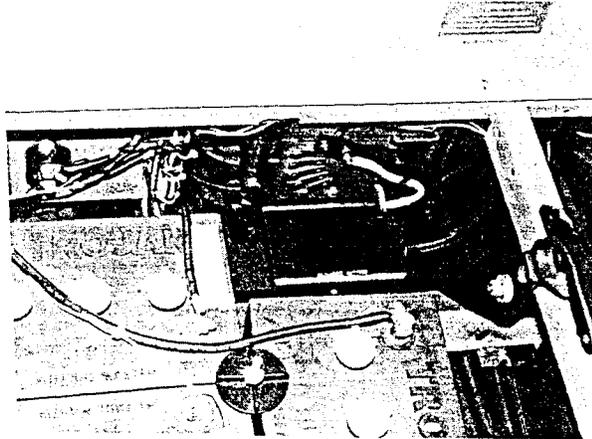
ADJUSTMENT

Refer to adjustment in this section for proper adjustment and service procedures.

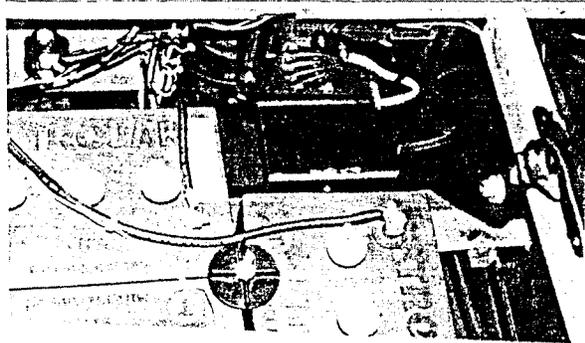
It is recommended that all terminal connections be checked and tightened at least once a month. If a terminal bolt or wire becomes loose, sufficient heat will be generated to cause permanent damage to the connection. Care should also be taken at each inspection to ensure that proper contact is maintained between arm and power bars.

Arm and accelerator linkage should work freely allowing return spring to always return arm to neutral bar when accelerator is released.

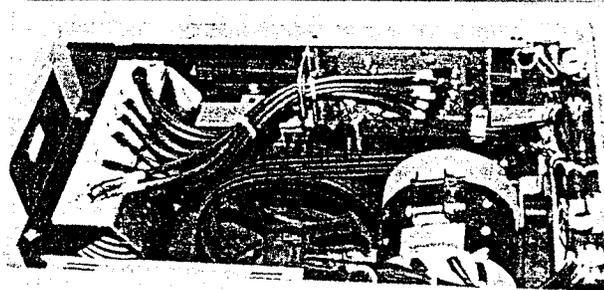
RHEOSTAT (FRONT SEAT REMOVED)

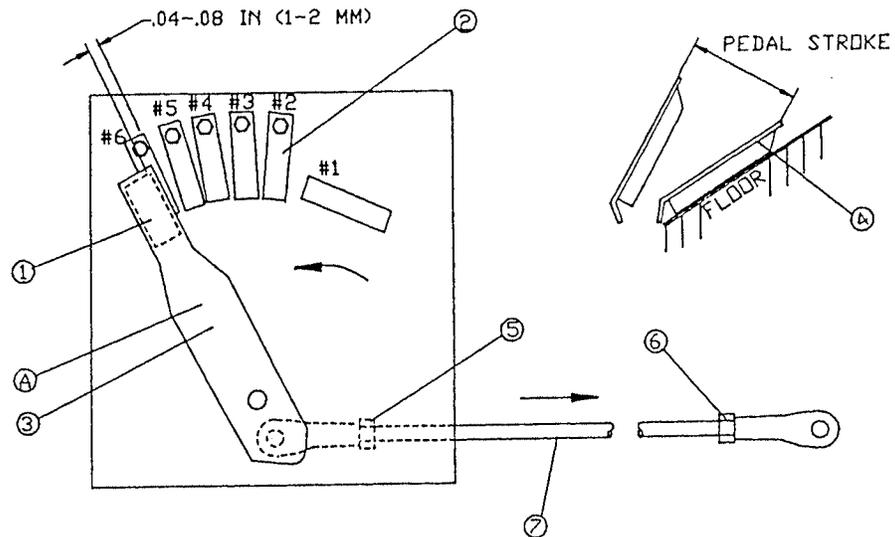


R 3-80 RHEOSTAT (FRONT SIDE)



R 3-80 RHEOSTAT (BACK SIDE)





- |                           |                      |                    |
|---------------------------|----------------------|--------------------|
| 1. MOVING CONTACT         | 4. ACCELERATOR PEDAL | 7. ACCELERATOR ROD |
| 2. FIXED CONTACTS (#1-#6) | 5. ADJUSTING NUT     |                    |
| 3. MOVING ARM             | 6. ADJUSTING NUT     |                    |

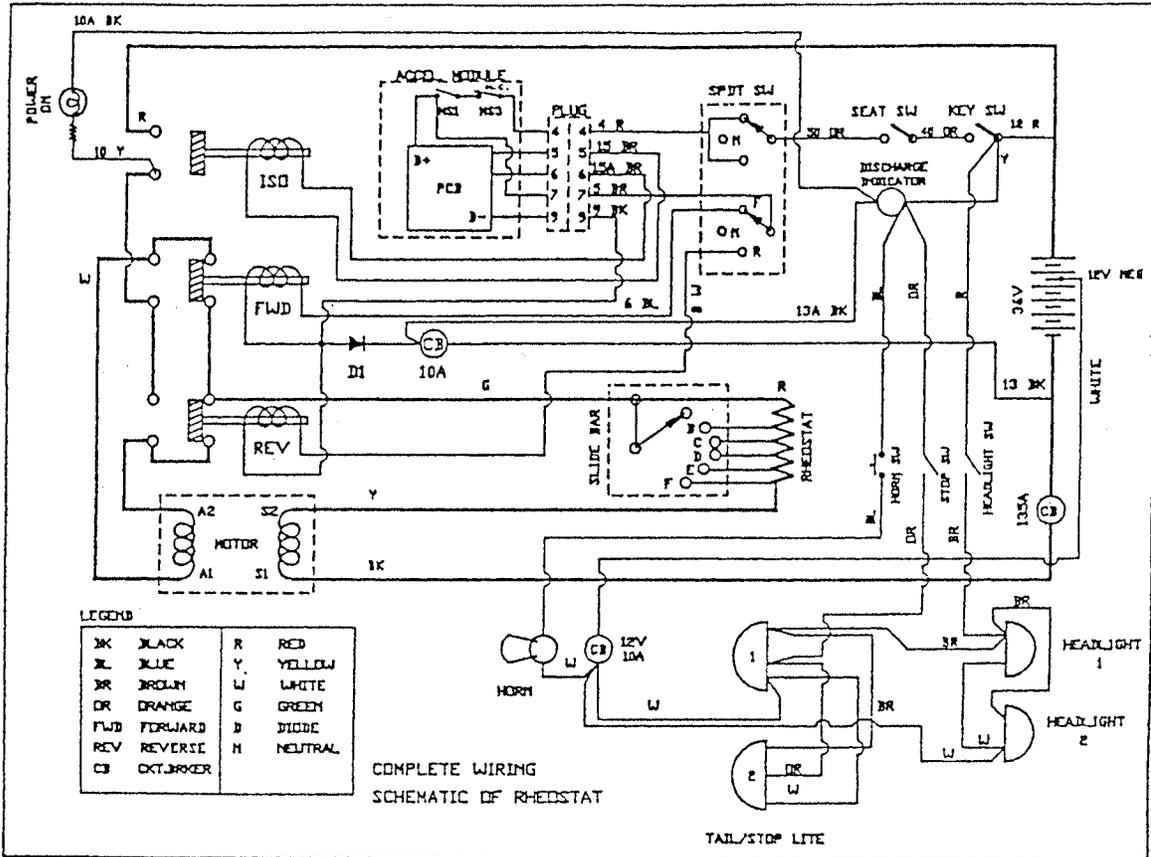
#### RHEOSTAT ADJUSTMENT

**WARNING:** Before working on the Rheostat, disconnect both the main positive and negative battery leads. Place the forward/reverse switch in neutral. Turn off ignition and remove key. Set parking brake.

#### ADJUSTMENT

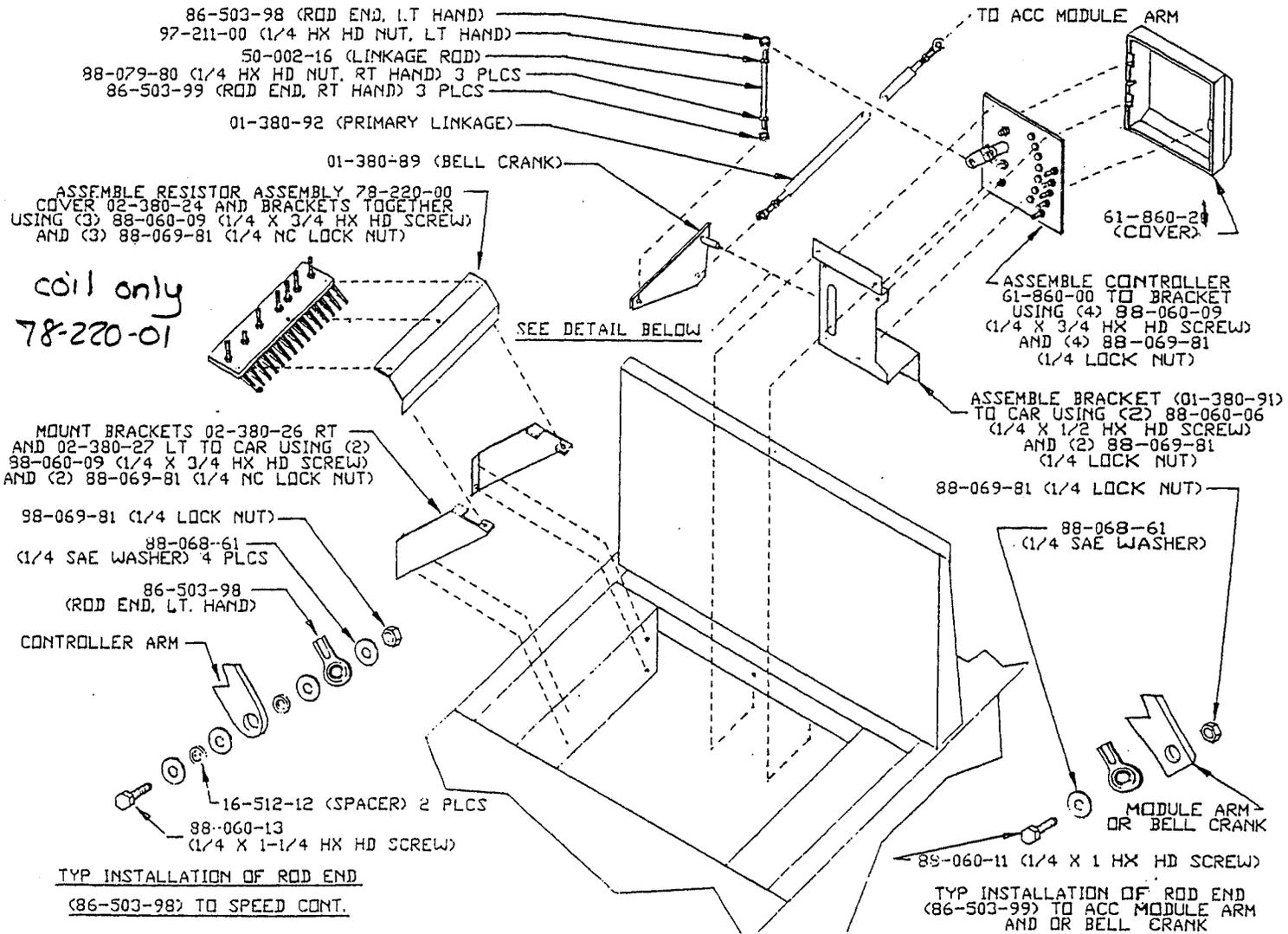
1. Slowly, depress the pedal 4, to full extent
2. Check that (on rheostat) moving contact 1, is located in position A (within the tolerance shown B) in respect to the fixed contact, #6.  
IF NOT WITHIN THE TOLERANCE:
  1. Loosen the two locknuts, 5 and 6
  2. Adjust the movable contact, 1 to the correct position shown above, pedal should be to the floor
  3. Secure locknuts, 5 and 6. Adjustment is complete.

RHEOSTAT WIRING SCHEMATIC



NOTE: USES SAME SOLENOID ASSEMBLY AS PWR-TRON II, SEE SECTION 15

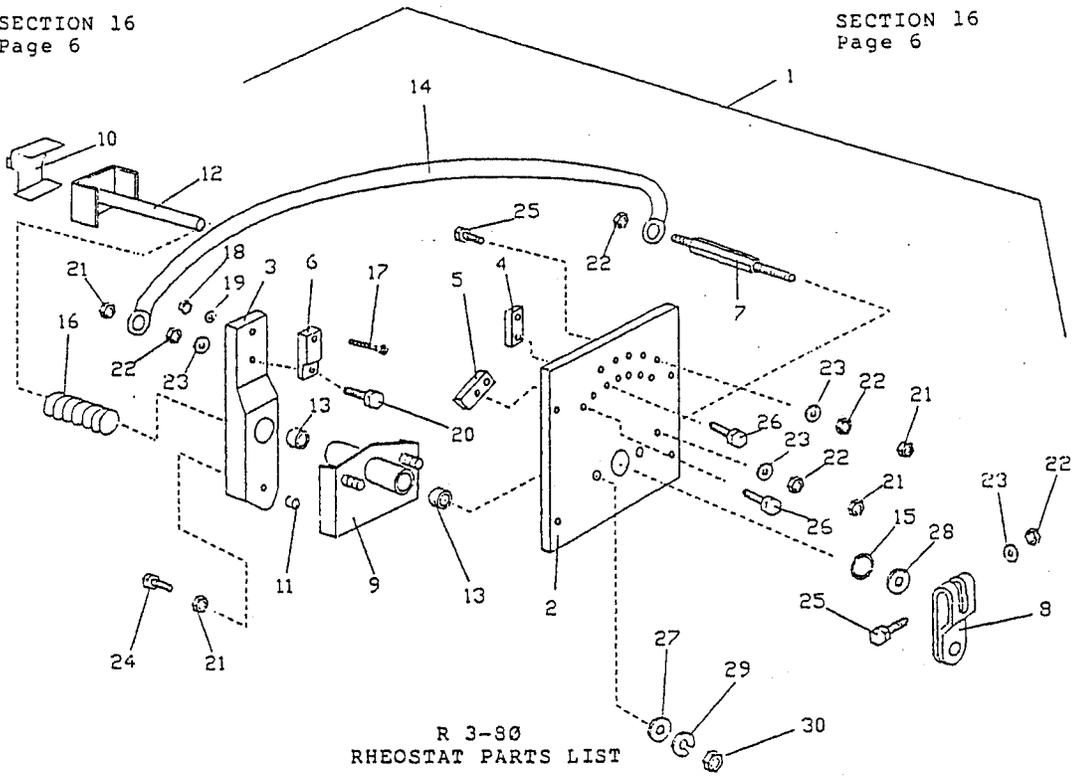
RHEOSTAT AND RESISTOR  
ASSEMBLY LINKAGE



72-501-36 ①  
 72-501-37 ②

SECTION 16  
 Page 6

SECTION 16  
 Page 6



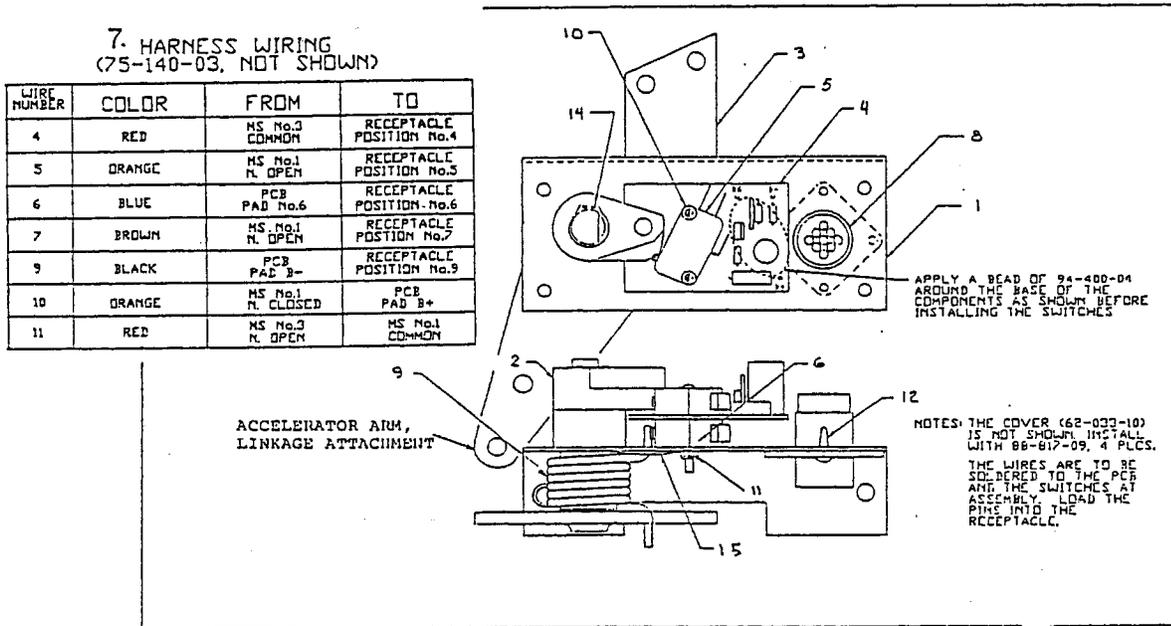
R 3-80  
 RHEOSTAT PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	61-860-00	RHEOSTAT CONTROLLER	1
2	61-860-01	BOARD, MOUNTING	1
3	61-860-02	ARM, CONTROLLER	1
4	61-860-04	CONTACT, FIXED 1-9/16 LONG	5
5	61-860-05	CONTACT, FIXED 1-3/4 LONG	1
6	61-860-06	CONTACT MOVING 1-5/8 LONG	1
7	61-860-07	STUD, 1/4-20 NC 2-5/16 LONG	1
8	61-860-08	LEVER, CONTROLLER	1
9	61-860-16	ASSEMBLY, SHAFT HOLDER W/BUSHINGS	1
10	61-860-10	GUARD, WIRE	1
11	61-860-11	CAP, BOLT CONTROLLER	1
12	61-860-13	WLDMNT, CONTROLLER SHAFT	1
13	32-208-00	BUSHING, BRONZE, 1/2 OD, 3/8 ID	1
14	75-235-30	JUMPER, 6-1/2 LONG, FLEXIELE	1
15	80-714-00	O-RING, 3/8 ID X 5/64 THICK	1
16	85-061-00	SPRING, COMP .72 OD X 1-1/4 LONG	1
17	88-026-10	SCREW, 8-32 X 7/8 FLAT HEAD SLOT	1
18	88-029-80	NUT, 3-32 HEX	1
19	88-028-62	LOCKWASHER #8	1
20	88-060-11	SCREW, 1/4-20 X 1 HEX HEAD CAP	1
21	88-069-80	NUT, 1/4-20 HEX HEAD	8
22	88-069-87	NUT, 1/4 KEPS (LOCK)	9
23	88-068-61	WASHER, 1/4 SAE	8
24	88-060-12	SCREW, 1/4-20 X 1-1/8 HEX HEAD CAP	1
25	88-060-13	SCREW, 1/4-20 X 1-1/4 HEX HEAD CAP	6
26	88-060-06	SCREW, 1/4-20 X 1/2 HEX HEAD CAP	7
27	88-088-61	WASHER, 5/16 SAE	2
28	88-108-61	WASHER, 3/8 SAE	1
29	88-088-62	WASHER, 3/8 LOCK	2
30	88-089-80	NUT, 5/16 HEX HEAD	2

ACCELERATOR RHEOSTAT CONTROL

GENERAL FEATURES:

The accelerator mounts directly to the accelerator pedal. The accelerator arm connects to the Rheostat via rods and a bell-crank, (see page 5, Control Linkage) connecting to the Rheostat arm, located under the front seat.



ASSEMBLY RHEOSTAT ACCELERATOR  
PART NUMBER 62-033-40

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	62-033-01	ASSEMBLY, BACKING PLATE	1
2	62-033-06	CAM, W/O MAGNET	1
	62-033-10	COVER, SOLID STATE ACCELERATOR (NOT SHOWN)	1
3	62-033-50	WLDMNT, ROTOR, RHEOSTAT	1
4	62-033-81	PCB, INTERLOCK, RHEO, W/COMP	1
5	71-127-00	SW, SNAP ACTION, MINIATURE	1
6	71-127-05	SWT, SNAP ACTION, SHORT LEVER	1
7	75-140-03	HARNESS, RHEOSTAT ACCEL	1
8	75-440-20	RECEPTACLE, SQUARE FLANGE, 9 PIN	1
	75-440-22	SEAL, RECEPTACLE, 9 POSITION AMP (NOT SHOWN)	1
9	85-352-38	SPRING, TORSION, SOLID STATE	1
10	88-005-11	4-40 X 1-1/4 TRUSS HEAD SCREW	2
11	88-009-31	4-40 LOCK NUT	2
12	88-606-00	CLIP, CANOE, .125 X .16 GRIP	2
13	88-817-09	#8 X 3/4 PAN HD METAL SCR (FOR COVER MOUNTING)	4
14	88-840-08	RING SNAP 1/2 EXT	1
15	97-181-00	WASHER, 22 GA SST, .141 X .875	1

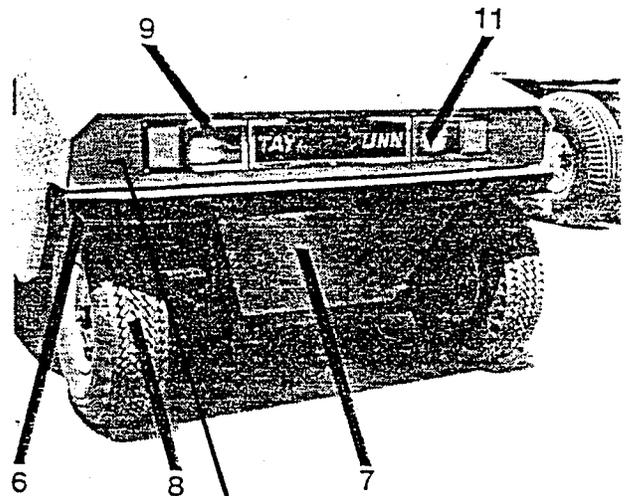
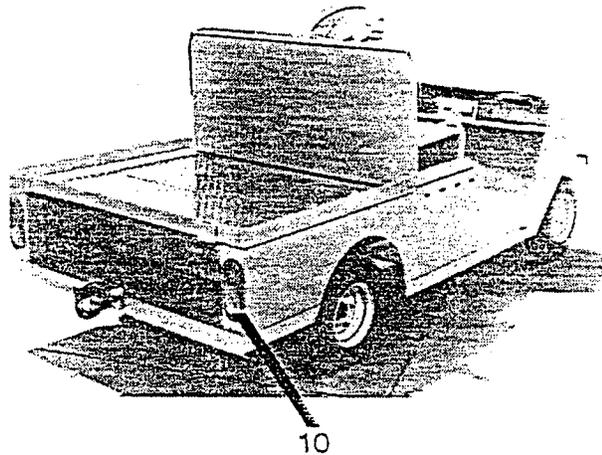
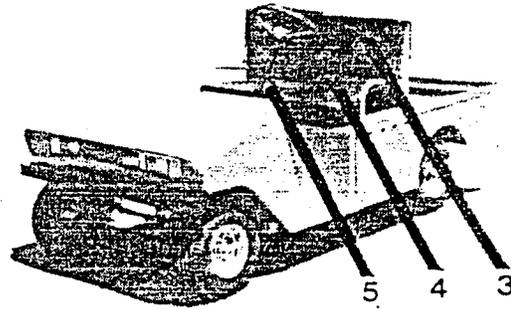
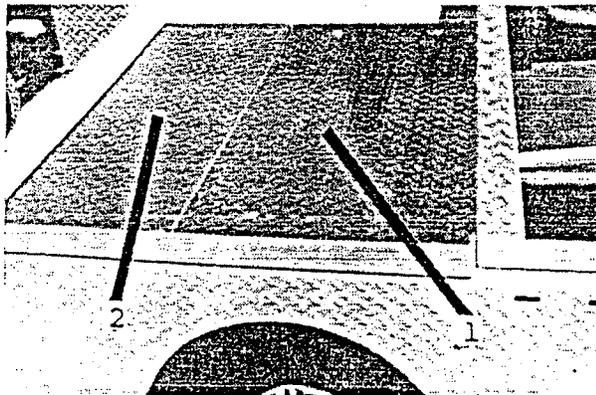
OPTIONS AND KITS

GENERAL: This section illustrates the many additional options to increase the usage of your vehicle. Some of these kits can be added with basic tools, ie; side mirrors, rotating beacon turn signals and seat belts. All other kits should be installed at an authorized Taylor-Dunn dealership. This section is only a guide for various options that will aid you in improving the operation and serviceability of your vehicle.

BODY AND TRIM  
(OPTIONAL) FIELD KITS

The following field kits are supplied as an additional option for customizing your R 3-80. See illustration of major kit packages, next page. All metal parts are orange. All other colors are special.

KIT NO.	DESCRIPTION
90-109-62	Second seat
97-804-61	Pintle hitch
97-808-61	Automatic coupling hitch
91-120-62	Surrey top
91-340-63	Kit, tool box
90-300-60	Kit, side and end rails
90-300-61	Kit, side rails
74-010-61	Windshield Wiper
91-011-10	Kit, cab (all metal) with windshield and rear window, less doors
91-010-68	Kit, door (all metal) with sliding glass window, left hand
91-010-69	Kit, door (all metal) with sliding glass window, right hand
71-141-62	Turn signals, front and rear
90-160-61	Seat belts
73-005-60	Reverse warning beeper
72-023-61	Rotating amber light, pole
72-023-62	Rotating amber light, cab
92-202-60	Mirror
62-025-60	PWR-PLUS 36V Kit, Magnetic Accelerator



BODY AND TRIM

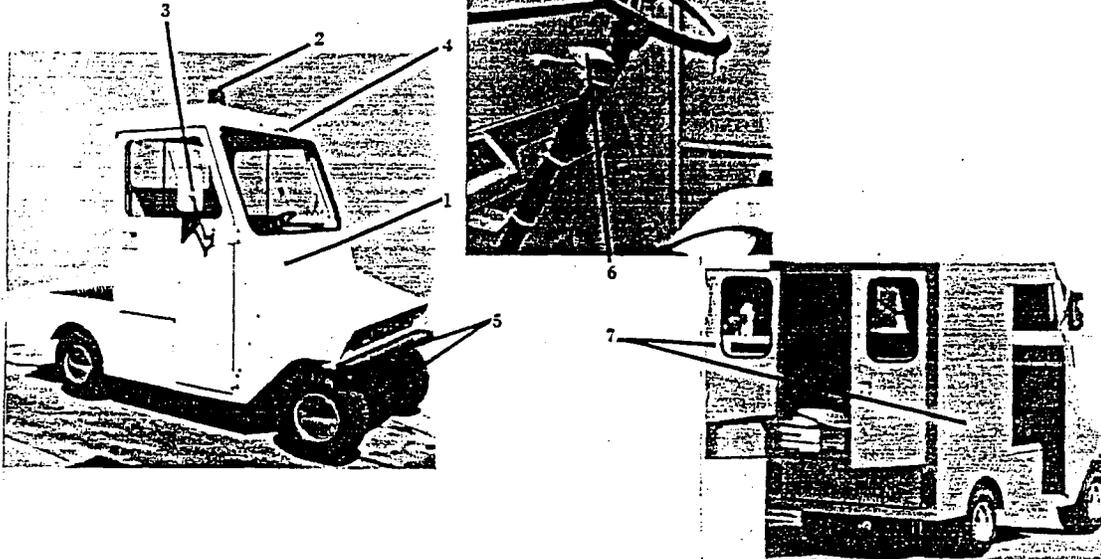
02-380-47

ITEM	PART NO.	DESCRIPTION	QTY.
1.	00-380-37	Deckboard, Stationary, (Forward)	1
2.	00-380-38	Deckboard, Tool Box Top, (Rear)	1
3.	90-172-00	Cushion, Backrest	1
4.	90-173-00	Cushion, Seat, Driver	1
5.	90-174-00	Cushion, Seat, Passenger	1
6.	01-380-16	Bumper (Optional)	1
7.	00-380-55	Splash Pan (Optional)	1
8.	13-742-00	Tires, 5.70 x 8 Pneumatic Load Range B, Hiway Tread	4
9.	72-072-00	Headlight, 4 Inch, 12 Volt	2
10.	72-025-00	Taillight, Stop, Turn, Red	2
11.	94-050-00	Lens, Light, Front	2

New STYLE

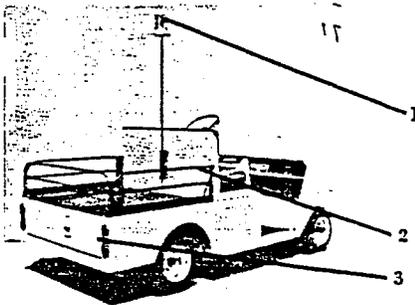
94-050-10 Left

94-050-11 RIGHT

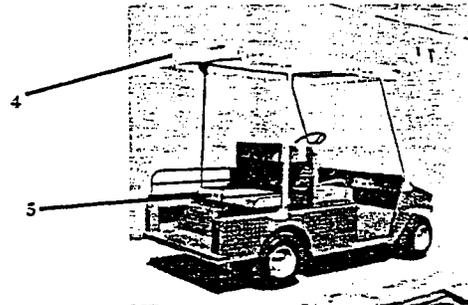


KIT, ALL METAL CAB

I.D. NO.	PART NO.	DESCRIPTION	QTY.
1	91-011-61	KIT, METAL CAB ASSEMBLY WITH DOORS, GLASS	1
	91-011-60	KIT, METAL CAB WITHOUT DOORS, WITH GLASS	1
	91-010-68	LEFT HAND KIT, DOOR INCLUDES SLIDING GLASS WINDOW	1
	91-010-69	RIGHT HAND KIT, DOOR INCLUDES SLIDING GLASS WINDOW	1
2.	72-023-62	KIT, ROTATING BEACON	1
3.	92-202-60	KIT, REAR VIEW MIRROR, FITS RIGHT OR LEFT SIDE	1
4.	74-010-61	KIT, WINDSHIELD WIPER	1
5.	01-380-60	KIT, BUMPER WITH SPLASH GUARD	1
6.	74-141-61	KIT, TURN SIGNAL	1
	60-160-61	KIT, SEAT BELT, NOT SHOWN	
7.	91-322-60	KIT, CARGO BOX WITH REAR DOORS	1



R 3-80 WITH ROTATING BEACON  
CARGO RAILS AND TOOL BOX



R 3-80 WITH SURREY TOP  
AND FOLDAWAY SECOND SEAT

I.D. NO.	PART NO.	DESCRIPTION	QTY.
1	72-023-61	KIT, ROTATING BEACON ON POLE	1
2	90-300-60	KIT, CARGO RAILS	1
3	91-340-63	KIT, TOOL BOX W/LOCKING DOORS	1
4	91-120-62	KIT, SURREY TOP WITH SUPPORT POSTS	1
5.	90-109-62	KIT, FOLD DOWN 2ND SEAT	1
	15-380-60	KIT, STEERING NEUTRAL AXIS	1

PARTS ORDERING PROCEDURE

Parts may be purchased from your local authorized Taylor-Dunn dealer. When ordering parts, be sure to specify the complete model number and serial number of this unit. Also specify the full Taylor-Dunn part number, description of part and quantity of parts required. When ordering parts for the drive motor, also include the specifications found on the motor name plate. Be sure to give complete shipping and billing address on all orders. Example:

1 - Part Number - 86-501-98 - Ball joint (left hand thread)

1 - Set of 2 - Part Number - 70-005-00 - Brush Assembly G.E. motor, 36 Volt

Above parts for model R 3-80 truck, beginning with serial number 81496

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 COMPANY  
2114 West Ball Road  
Anaheim, CA 92804

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

N O T I C E O F C H A N G E

WE WANT OUR MANUALS TO BE USEFUL AND CORRECT. IF YOU DISCOVER AN ERROR OR WISH TO SUGGEST CHANGES, PLEASE FILL OUT THIS SHEET AND MAIL IT TO TAYLOR-DUNN.

MANUAL NO. \_\_\_\_\_ SERIAL NO. \_\_\_\_\_ DATE: \_\_\_\_\_

\* AN ERROR(S) EXISTS ON THE FOLLOWING SECTION(S) AND PAGE(S) NO.

SECTION \_\_\_\_\_ PAGE NO. \_\_\_\_\_ LINE OR ITEM \_\_\_\_\_

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\* EXAMPLE: Section 13, Page 5, Item 5.  
PART NO. 41-350-55 KIT, CYLINDER REPAIR SHOULD BE PART NO. 41-350-66.

MAIL TO: TAYLOR-DUNN  
ATTN: ENGINEERING  
2114 W. BALL ROAD  
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